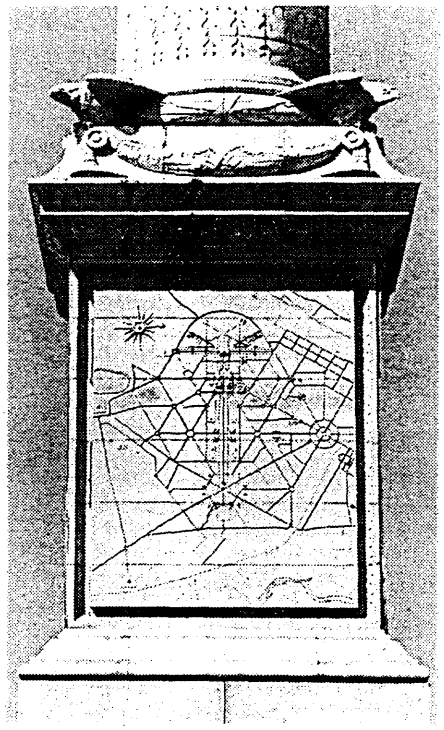
READING MAPS AS PLANS:
Changing Perceptions of Delhi



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Abstract

The common perception of maps as 'scientific' images and objective records of topographic features has undermined the role of ideology in their evolving form and use. This thesis contends that the structuring of maps and map content is not only a function of available technique and existing topography, but is also related to prevailing social and political values in the city that motivate its form of development. The thesis rests on the premise that maps are not value free representations but deliberate interpretations through selective representation. In reading maps as plans, it seeks to uncover a latent socio-political intention in the very act of map making.

The relationship between maps and the city is explored in the specific historical context of Delhi from the seventeenth century to the present. The development of the cartographic representation of the city is looked at in parallel with the development of the city. This simultaneous analysis is an attempt to correlate cartographic fact with the context within which it was produced. It is an exploratory research on the influence of the city on maps and map making, and the potential influence of map knowledge on the city.

The nature of the interaction between map and context that emerges from this study verifies the thesis that transformations in the form and content of maps can be attributed to changing values in the city as much as to its changing morphology. Without intending to be an explicit symbol or metaphor, a map -- even in its 'scientific' documentary role -- can represent social and political inclinations of society, encode prevailing theories of urban form, and -- through its instrumentality -- become a participant in future developments in the city.

Thesis Supervisor: Julian Beinart
Title: Professor of Architecture

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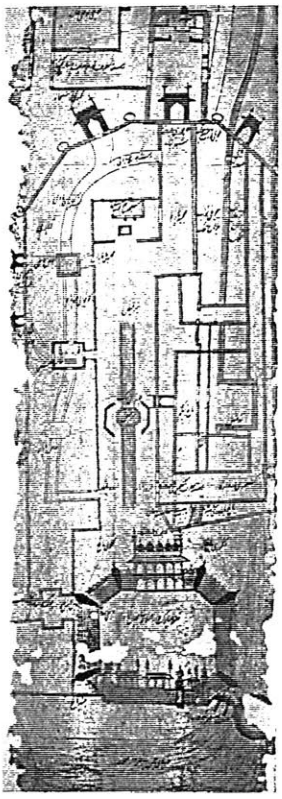
Contents



Persian itinerary (detail)

Town plan: Shahjahanabad

Introduction

The depiction of the city in the eighteenth century Persian itinerary on the facing page shows a fortress, a major thoroughfare, two mosques, the city wall, and the main gates. The definition of the form of the city appears to be based on a familiarity with its character. Important elements are selected and others omitted to convey a particular image in the representation.

The nineteenth century map to its right does not reflect the hierarchy of its elements through such visual exaggeration. Topographically accurate, 'true' rather than pictorial in it representation, it is the product of a detailed survey. There is an indication of the residential sector and a more intricate internal network of streets and spaces, besides the main institutions. It shows the city as an aggregate of all its constituent parts in accurate proportion, rather than symbolically through a few dominant elements.

Both are maps of Shahjahanabad or Old Delhi, separated by about 75 years.

These maps do not merely record physical features in the city. They also mirror a certain 'idea' about the city that the map maker had and could convey, either deliberately or subconsciously, within the dictates of technique and technology. Through a selection of content, symbolization, and style of representation, they have the ability to capture and reflect this understanding of the city. Moreover, the nature of the information that they attempt to formalize, reflects the socio-political values and concerns of the era in which they were made.

This thesis contends that the structuring of maps and map content is not only the product of available technique and existing topography but is related to a contemporary understanding of the city.

The commonly held notion that maps are objective, 'scientific' images, makes the task of reading their content as subject to any form of influence difficult. The history of cartography has mainly been concerned with the evolution of survey techniques and innovations in the accurate collection of geographic information. Most of the research has focused on technical problems -- acquiring and perfecting geographical and topographic data, devising ways of symbolizing it and inventing methods of preparing it.[1] Some research on issues of communication and cognition in mapping was conducted in the sixties and seventies, but the role of society and politics on the selection of information to be represented has not attracted much research attention.

Josef Konvitz's book on the political and institutional aspects of seventeenth and eighteenth century French cartography was important in relating map making practices and the diffusion of new techniques to cultural, technical, and political factors external to cartography. Dealing with the "interaction between cartography and public affairs,"[2] it is one of the few works to situate map making within the socio-political context of its practice.

It is only recently, however, that research on the subject has looked at maps as a socially constructed form of knowledge. J. B. Harley's article "Maps, Knowledge, and Power," has been seminal in pointing out that -- through their content and mode of representation, -- the making and using of maps have been pervaded by ideology. In Harley's words, this implies that:

> "Maps cease to be understood primarily as inert records of morphological landscapes or passive reflections of the world of objects, but are regarded as refracted images contributing to dialogue in a socially constructed world. We thus move the reading of maps away from the canons of traditional cartographic criticisms with its binary oppositions between maps that are 'true and false', 'accurate and inaccurate', 'objective and subjective', 'literal and symbolic', or between those that are based on 'scientific integrity' as opposed to 'ideological distortion'."[3]

The premise is that maps are not value free images but deliberate interpretations through selective representation.

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[1]Robinson, Arthur H., and Barbara Bartz Petchenik, *The Nature of maps.* Preface.
[2]Konvitz, Josef, *Cartography in France, 1660 - 1848.* Introduction.
[3]Harley, J. B., "Maps, Knowledge, and Power" in *The Iconography of Landscape.* p. 278.

Reading maps as plans

The thesis accepts this premise and seeks to explore the relationship between maps and society in the specific historical context of Delhi, from the seventeenth century to the present. In looking beyond the immediate applicability and passive documentary role of maps, it seeks to uncover a larger social or political motive behind their form and use. In reading maps as plans, it also looks for a possible future intention in the selection of information and style of representation.

Delhi has been the site for a series of major political events that have been followed by significant modifications of its socio-cultural and physical landscape. From the origin of the city around 1500 B. C. to the present, there have been as many as seventeen different settlements of varying size and importance within a site of about six by twelve miles along the river. However, it is only since the seventeenth century, when the city of Shahjahanabad was built, that visible evidence of the nature of development is preserved. It is also the earliest era of which we have maps.

During this period, at least five events can be identified that were transition points in the modification of the social and physical development of the city. The founding of the Imperial city of Shahjahanabad in 1647, the arrival of the British military and administrative presence in 1803, the Revolt of 1857 leading to the transfer of power to the British Crown, the decision to build a new capital in 1911, and the influx of hundreds of thousands of refugees from newly-formed Pakistan in 1947 -- each incident inaugurated a different set of requirements and new socio-political values that led to new priorities for administration and expansion. The many transition points in Delhi's growth provide an ideal opportunity to observe variations in maps of the city through its history, in relation to socio-political change.

The structure of the thesis

In the following chapters the development of the cartographic representation of Delhi is looked at in parallel with the development of the city. The period under consideration -- 1648 until the present -- has been divided into five phases, each introduced by a major political event.

The discussion of each phase begins with a description of the city in terms of important social and political events of the time and their impact on its physical form. It tries to identify a dominant perception of the city -- defined as a set of ideas about a desired social or spatial structure or a tangible ideology that motivates growth and expansion -- that is typical to the period.

Each city description is followed by an analysis of maps against the background of knowledge about the city at the time of their production. Possible influences of the events in the city on maps is inferred mainly on the basis of observations regarding the nature of content, the degree of detail shown, and the style of representation.

The five phases are discussed under three broad chapter headings. The first chapter deals with Mughal Shahjahanabad since 1647, the second with developments in the British colonial period, and the third with post-independence urbanization. Each chapter marks not only a transition between political systems but also the adoption of a new cartographic technique characteristic of the era. A section at the conclusion of each chapter summarizes the important points of congruence between maps and notions about the city in that period.

The maps that are being discussed have been selected from a genre typical of the period when they made. This thesis is a commentary about a string of such maps that illuminate a series of themes that have progressively informed the development of Delhi. It is exploratory in its research and emphasizes a process of empirical observation and speculative inference about the relationship between map making and the city.

Chapter 1

PICTORIAL MAPS OF MUGHAL SHAHJAHANABAD

The Imperial City: 1647 - 1739

Emperor Shahjahan -- a great patron of art, architecture, and culture -- was also the most prolific builder among all the Mughal rulers. His ambition to create a city that would immortalize his name prompted him in 1639, to shift the capital of the empire from Agra to Delhi, alleging as the reason for the move, the intolerable summer heat to which that city was exposed.[4] Shahjahanabad, as the new city came to be called, served as the Mughal capital from 1648 until the virtual demise of the empire in 1739.[5]

As an imperial center, governmental functions and courtly culture dominated not only the societal, but also the formal structure of Shahjahanabad. More akin to contemporary capital cities such as Isfahan and Istanbul than to non capital cities within the Indian subcontinent, it derived its formal character and image largely from the interaction between the court and places designed for enacting courtly life. In this section, I will describe the primary influences on the city, and the sequence of development of major elements in it. This will form a context for the following discussion, in the next section, on the content and presentation of indigenous maps of this period.

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[4]Gupta, *Delhi Between Two Empires*, p 1.

[5]The invasion of Nadir Shah in 1739 effectively ended the stable, continuous reign of the Mughals and set the stage for the conquest of Delhi by others including Ahmad Shah and the Marathas. Although Shahjahanabad remained the seat of the Mughal ruler until 1858 when India passed into the hands of the British Crown, the years following 1739 saw the empire being reduced to playing a ceremonial rather than effective role.

City elements: The generative role of the court and its culture

> "Having settled on a site, Shahjahan was eager to begin work. On 29 April, 1639 Ghairat Khan (Subedar of Delhi) ordered the two expert builders of his establishment, Ustad Ahmad and Ustad Hamid, to begin digging. In two weeks initial spadework was completed. Princes and high-ranking amirs, having received plots of land about the site, ordered plans drawn up and work begun on their mansions. In the four months of his tenure Ghairat Khan completed the excavations and collected building materials. Under Allah Vardi Khan the palace walls fronting the river were erected. And Makramat Khan, who replaced Allah Vardi Khan, presided over the completion of the walls, buildings, and gardens of the palace-fortress. When the palace-fortress was finished, Shahjahan was notified."[6]

On 19 April, 1648, the day the household astrologers declared auspicious for the purpose, the Emperor entered his palace. Only nine years had elapsed since the inception, and within another few years the city would acquire all the elements that were required to support its primary functions.

The palace-fortress, Chandni Chowk -- the main thoroughfare and hub of commercial and social activity, Faiz Bazar -- a secondary street running perpendicular to Chandni Chowk from the fortress, a few mosques -- notably the Jama Masjid and the Fatehpuri Masjid, and mansions of the nobility were the main formal elements of the city. Their organization and relative orientation was facilitated by deliberate, sequential, city building design moves by members of the ruling family and nobility, and served to create the monumental, civic urban quality that the city was known for.

The palace-fortress was the focal point of the city -- the container of its essential functions of government and imperial residence. The arrangement of buildings and distribution of people and functions within it was carefully designed and laid out to reflect the social hierarchies and functional sequences of the court. Court etiquette and protocol had become very formalized by this time, having been developed prior to this in Agra, Fatehpur Sikri, and Lahore. Shahjahanabad which followed them, displayed the culmination of a highly developed sense of organization and spatial articulation that can be seen in **figure i.**[7] The perception of the

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[6]Blake, *Shahjahanabad: The Sovereign City in Mughal India,* p 30.

[7]The fortress was comprehended as a single building comprising of open and covered spaces, evident in the plan shown in figure i.

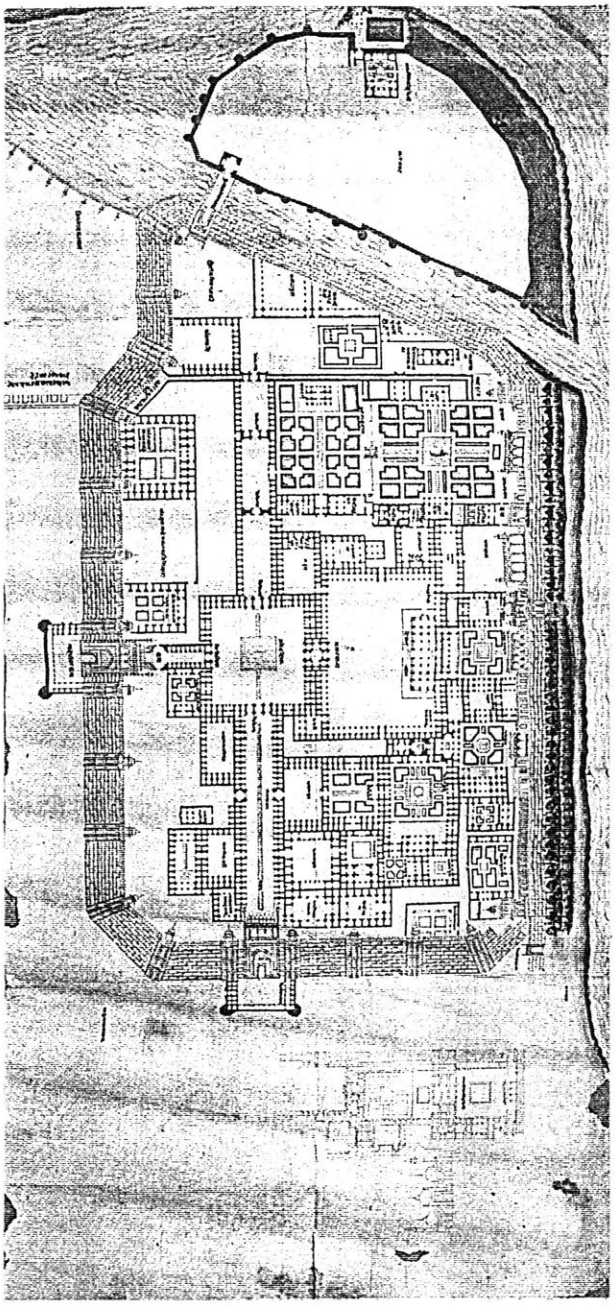

Figure i. Delhi fort, c. 1752

fortress with all its functions and buildings as a single unified entity was just beginning to be tentatively translated to the larger city scale where the fortress itself was a single element.[8]

Grand *havelis* or mansions of the Emperor's courtiers had also started emerging along with fortress, at the same time. Many were built along the lines of the palace and were mini complexes surrounded by compound walls. They often contained spacious gardens and watercourses. The necessary proximity to the centers of political and cultural activity caused them to cluster around the fortress and along other important areas such as the mosques.

Just outside the fortress were the two major thoroughfares or bazaars (marketplaces) of the city, which took shape soon after the construction of the fortress. The most important one of these, Chandni Chowk, stretched in a long straight line from the main entrance of the fort (Lahori Gate) to the Fatehpuri Masjid. It was laid out on the orders of the Emperor's favorite daughter Jahanara Begum in 1650, two years after the completion of the fortress. The street was extremely formal in its design, with colonnades on either side and a series of geometrically designed squares that opened out along its length; a central water channel ran through it's center linking small pools at these squares; a row of trees flanking the channel emphasized the formal linearity and importance of the street. Public buildings such as mosques, temples and caravansarais, and important mansions were interspersed between the shops along the main street. Less legendary than Chandni Chowk but as formal in its layout, Faiz Bazar was also laid out at the same time by another princess, Akbarabadi Begum, and stretched outwards from the Akbarabadi Gate of the palace. It was perpendicular to Chandni Chowk and contained similar functions of commerce, residence, and socio-cultural activity.

[8]Blake (*Shahjahanabad...*) uses the imperial mansion (or fortress) as a metaphor to explain the organization of the city, where the fortress itself becomes a single element. However, the clarity with which relationships between elements within the fortress was seen, was evident -- at the city level -- only between certain elements - Chandni Chowk, Faiz Bazar, the fortress, and the two main mosques; parts of the city such as residential *mohallas* did not appear to form a part of this system.

While much of the social and cultural activity of the members of the imperial household and the city elite revolved around the palace and court, it sometimes extended into the domain just outside the fortress along the commercial areas and residences of the amirs. Many royal cities have seen aspects of courtly life and city functions like processions and fairs spillover from the palace complex onto the main roads that approached it. In Shahjahanabad, this phenomenon was recognized and established by the formal act of designing these roads as a stage set for such festivities. The ceremonial nature of Chandni Chowk made it an icon for the city; it was a gesture that became inseparably associated with the imperial image and spirit that the city stood for. While the urban design attention these thoroughfares received from the elite may be attributed to their importance in extending imperial life outward, it also represented a highly developed urban culture and the organization of space at the city level to support it.

Mosques -- alternate focal points in the city and places of congregation for a common religious, political, or social purpose -- were also built through imperial patronage, and occupied prominent spots along the main thoroughfares. Jama Masjid, located atop a small hill was the main congregational mosque of the city. Fatehpuri Masjid, built by one of the queens terminated the axis of Chandni Chowk. The Akbarabadi Masjid was built at the head of the Faiz Bazar, just south of the palace gate of the same name. Other public buildings were also commissioned by the ruling family. Jahanara Begum built a caravansarai, a formal garden, and a public bath around the main central square of Chandni Chowk. Coffeehouses and similar gathering places also came up along these avenues. Such acts enhanced the public character of the two thoroughfares and a tight 'armature' of functions and form began to swell out from the civic 'skeleton' of roads and fortress.

The role of the imperial core in the definition of image

A very strong awareness of the role of the skeleton in creating the form and image of the city was evident at each stage in the design of the city. An acknowledgment of this underlying organization also appears repeatedly in

maps and drawings of the city done at this time. The discussion of maps in the following section will refer to this dominant image of the city and see how it was reflected in the selection of map content and technique.

The other recurring feature in representations of the time is the containing wall. Historically however, there is little reference to the population that settled within these walls or outside it in *mohallas* or quarters which have subsequently become an important subject for study of urban fabric and traditional house form. The only mention of domestic building besides the architecture of grand mansions can be found in travelers accounts. Bernier, in the seventeenth century, writes that much of the population lived in "straw thatched mud huts scattered about...that gobbled up much of the open space within the city." Hakim Maharat Khan talks about the great difficulty of eighteenth century residents in negotiating the clogged passageways that led to their houses.[9] There are varying accounts that give some indication of the size of the population that supported the city, guild organizations, and social structure at the lower level, but there are no descriptions of the form and layout of these dwellings. The residential sector of the majority of the population appeared to be subordinate to the public and imperial elements of the elite city. It was definitely not subject to imperially patronized urban design moves as the other elements were, at least in this phase of the city.

Stephen Blake suggests that the order and form of Shahjahanabad was inextricably tied to it's form of state organization. The patrimonial-bureaucratic emperor[10] dominated the social, economic, and cultural life of the city. The patron-client ties between the emperor and the nobles and between them and the members of their families bound the sovereign city into a vast extended family with the emperor as patriarch. These ties were often strengthened and reaffirmed in courtly and public ceremonies. The city as a stage for such ritual was a natural outcome of the very nature of its

[9]Blake, *Shahjahanabad..*, p 44; A discussion of Bernier's travel notes and Hakim Maharat Khan's writings on Shahjahanabad can be found here.

[10]Blake, *Shahjahanabad..;* A patrimonial bureaucratic empire has been defined as one where the emperor controls every aspect of the state as if it were a familial concern; thus, court related activity spreads over most parts of the city.

political structure, and was the dominating influence on its social and physical urban form.

The palace-fortress was the central institution of the city, and every subsequent structure like Chandni Chowk, Faiz Bazar, and mansions that came up around it, extended outward some of the functions and lifestyle of that central institution.[11] A certain hierarchical, functional relationship developed between these elements that dictated their orientation and proximity and eventually their shape. In Shahjahanabad, each act of city building reinforced this interaction between form, society, and politics and created by sequential addition, a relationship of formal elements into a unit that was identifiable as the 'city'.

[11] Blake (*Shahjahanabad...*) argues that Shahjahanabad was the urban conclusion to the patrimonial-bureaucratic premises of the state, emphasizing the influence of the cities political structure on its physical form.

The Map as Icon

The sequence of urban design actions that connected the most important and visible elements of the city to each other physically, coalesced the disparate pieces into one identifiable whole. The city appears to have been perceived as a composition of these features in certain relationship with each other. All maps that are to be discussed in the following section represented the city through these elements, recognizing their importance in the overall scheme, and the nature of the relationship between them. No matter what specific purpose the production of the map was to serve, it would organize the city as a composition of these basic features, to form a core that emphasized the connections within.

'Fort and Streets of Shahjahanabad'

This map, shown in **figure 1,** was probably drawn around 1750. It is a series of three maps - two long ones showing the main roads of Shahjahanabad - Chandni Chowk and Faiz Bazar, and the third showing the fort, but only the part that might be viewed from outside the walls. Through text and elevations, it shows important buildings -- residences, mosques, baths, and other institutions -- all along the two main thoroughfares. Text also mentions the names of streets and localities leading out of them, giving some indication of their occupational character, such as *Katra Neel* (locality of the indigo dyers), *Kucha-i-chooriwala* (the bangle maker's street) and *Kucha-i-dariba* (the silversmith's street).[12] While the text is in Persian with some French added later, neither its author nor the reasons for its production and use are known.

This map is the closest example of an urban town plan of Delhi from that time, even though it shows no more than the two major spines of the city - Chandni Chowk running from the fort entrance all the way to its termination at the entrance of the Fatehpuri Masjid and Faiz Bazar perpendicular to it. The palace-fortress shown in perimeter acts as the pivot, but is represented as another institution accessed from the streets rather than as its own entity.

[12]Gole, *Indian Maps and Plans,* p 178.

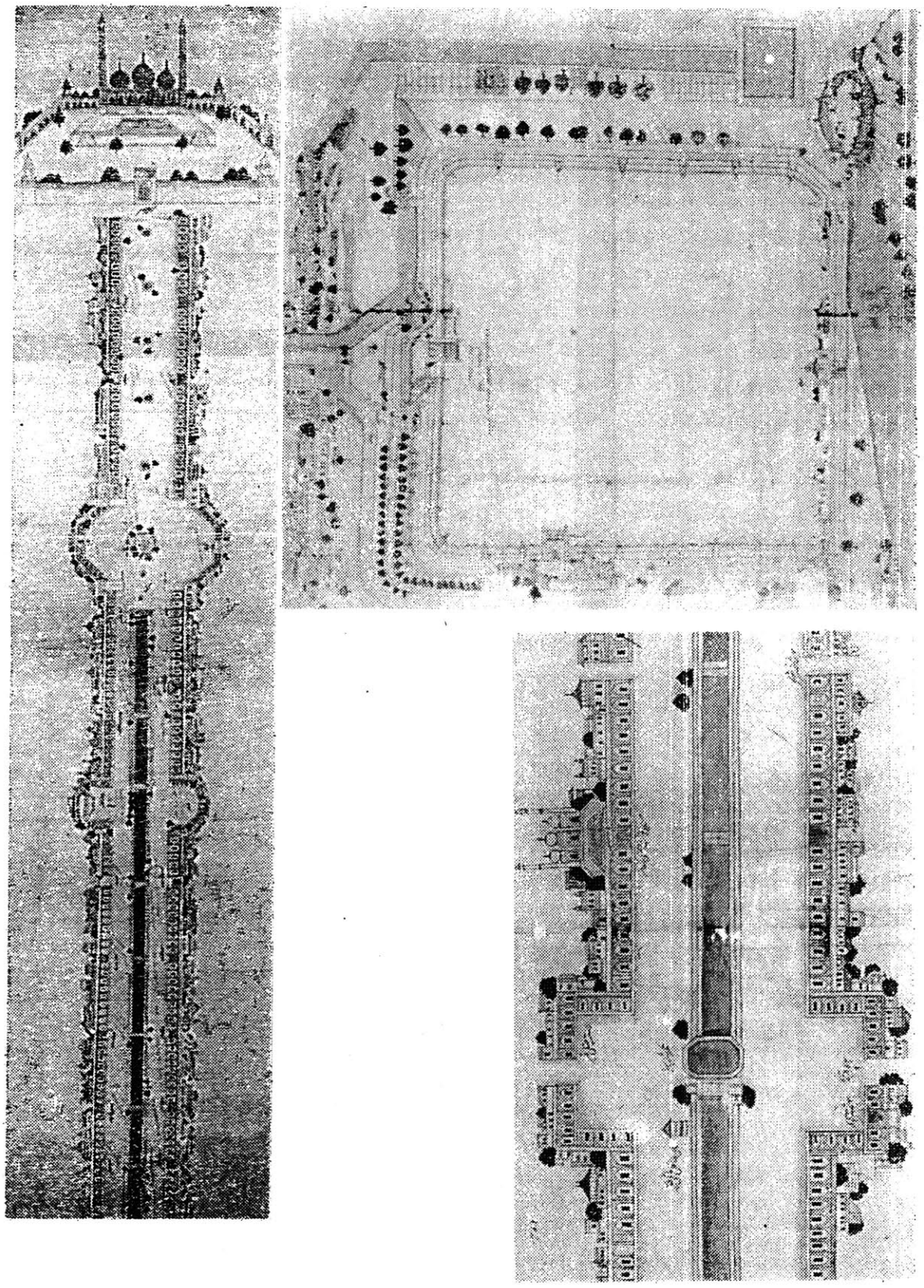

Figure 1. Fort and Streets of Shahjahanabad, c. 1750

The fortress orients the streets with respect to each other and establishes a relationship between them and itself. It builds up the skeleton of the city, positioning itself as the central generative institution with the streets leading off it and reinforces the importance of this skeleton as the core of the city.

The map is also a powerful demonstration of the linear manner in which relationships between urban elements are perceived. There exists a contiguity between two adjacent elements that structures their relationship. The main thoroughfares or core elements are seen in relation to the palace-fortress, while other institutions and quarters comprising the rest of the city are seen in relationship to the main thoroughfares - either fronting them or leading out of them via smaller streets. For example, the only locational attribute of Chandni Chowk that can be read from the map is that it runs in a straight line between the fortress and the Fatehpuri mosque. Similarly, the orientation of the Fatehpuri mosque assumes meaning only by virtue of its location at the end of Chandni Chowk. Streets that lead off the two main roads also do not display any attribute other than an adjacency to them. This progressive linkage - streets to the fort, institutions to the streets, and quarters to the skeleton strongly ties each feature with its preceding generative element.

While there is a strong understanding of the relationship between them and other elements, the streets are also seen as individual entities. The map is essentially about a set of urban elements and spaces outside the imperial complex, along Chandni Chowk and Faiz Bazar. The representational attention given to these streets is not surprising considering the socio-political, commercial, and cultural importance that they had. The design attention that they received as core elements is translated into a strong awareness of their importance and generative quality. The strict geometry of the street, the central canal, the series of squares, the pools, and the location of trees emphasizes the designed condition of these spaces. The uniform arcaded ground floor treatment does the same; it is not an accurate, but an exaggerated representation of the formality of the street. The elements are not shown in plan but as visual and verbal descriptions that contribute to the environment of the street they face. As we have seen in the

earlier section, the system formed by the two streets (Chandni Chowk more than Faiz Bazar) became the most clearly identifiable element of the city, and the perception of this skeleton as the dominant structure of the city is strongly brought out in this map - regardless of the intended use. This feature is also the most striking aspect of the next map that I will discuss.

'Plan of Dehly reduced from a large Hindostanny Map'

This map, made in the year 1800 and shown in **figure 2** (see page 24), is a British copy of an earlier indigenous map. There is no information about the date of production or purpose of the original. The translated copy however, is a defense map; it marks each bastion along the wall and specifies the distance between them with points of entry clearly marked. Additional details are written on the right side towards Lahore Gate.[13]

While the specific reason for the production of the original map is not known, the articulated elements are the same as in the earlier map -- the fort, shown with a degree of detail and geometry that is absent from the rest of the map, Chandni Chowk and Faiz Bazar much exaggerated in width along with the central water channel, the road that connects the Jama Masjid to other important points, and the enclosing wall. Relative location between these elements that seem to be identified as primary urban features of the city, is maintained. A certain geometry between them (like the perpendicularity between the two major streets, and axial relationship of the fort to the streets) is recorded in each of these maps and seems to be a consistent viewpoint in their production.

Within the walls of the town is contained the main armature -- the L-shaped arrangement of roads with the water channel, the fortress at the junction, and the two important mosques. Residential blocks that make up the fabric of the city are outlined in a much more arbitrary manner (than the central feature) and in many places, are compressed or stretched to fit the shape. A sketchy, abstract notion of internal streets can be deciphered in contrast to the exaggerated formality and importance of the main streets. A strong

[13]Gole, *Indian Maps...*, p 174.

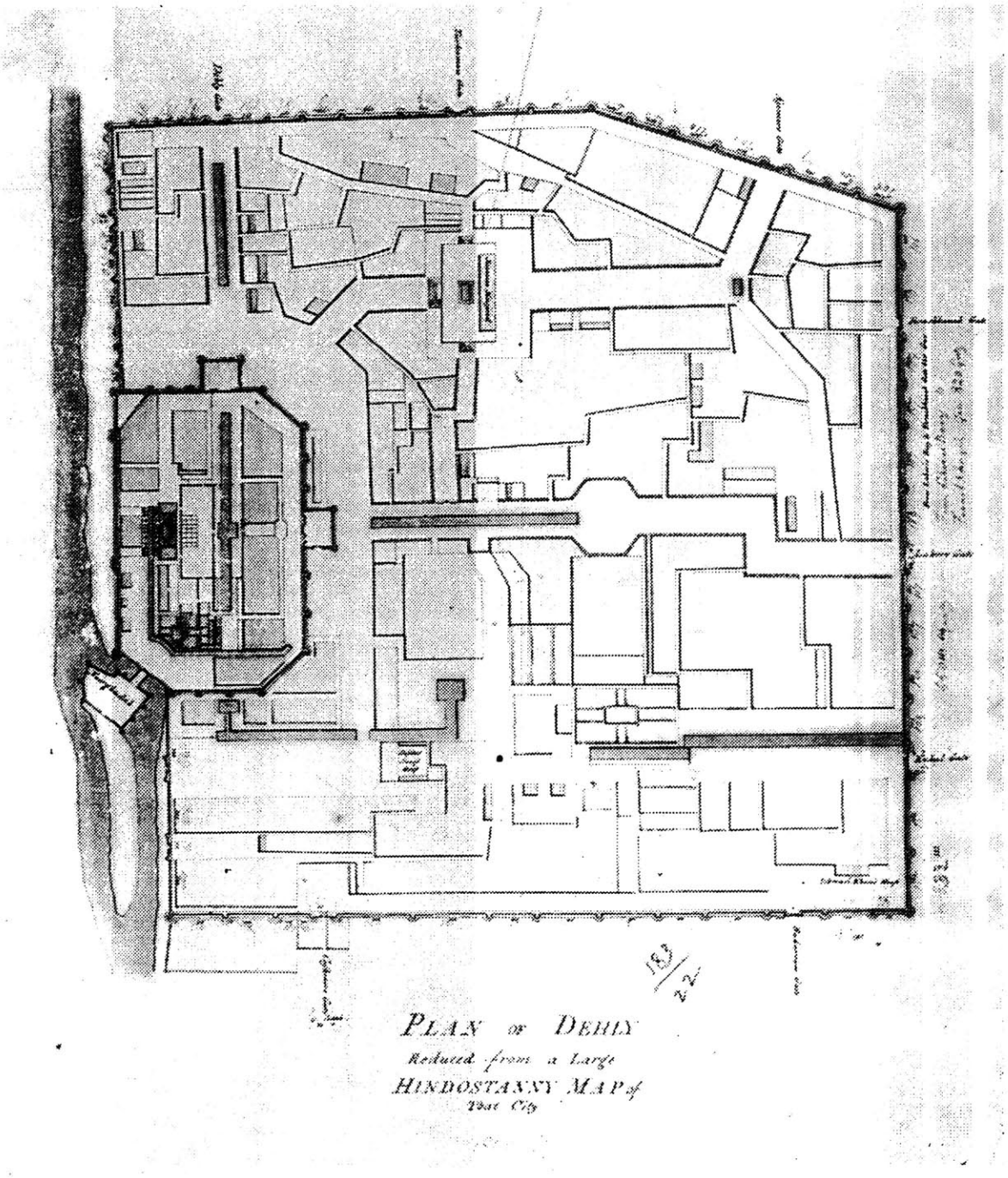

Figure 2. Plan of Dehly : Reduced from a Large Hindostanny Map of That City, c. 1800

visual and symbolic hierarchy is set up between the primary and secondary streets. Hardly any elements are marked within the fabric except the houses of a few prominent noblemen -- possibly a gesture towards the patron(s), or an orienting device rather than an effort to represent the residential sector of the city.

Although the use of this map may have been different than the earlier one, its cartographic nature is not very different. The notion of overall dimensional accuracy and scale is absent. The importance given to certain elements is more a function of perception than of topographic reality. While the details within might give specific information, this general attitude towards its representation indicates the relative importance that the core elements had in the map maker's understanding of the city. The more accurate, scaled method of representation which was introduced later by the British was not really a prerequisite for conveying a working relationship between the various elements in the plan. The importance of certain elements over others could be communicated without seeing the entire milieu in an accurate configuration. The hierarchical symbolization that was used was a technique more applicable to this intent. Future developments, such as the introduction of a Cartesian plane to represent topography while more successful in conveying dimensions, were inherently unsuitable to represent perception as a pictorial, topological system could.

The adaptation of such a map to convey dimensional information is curious. Besides indicating that perhaps an accurate map did not as yet exist of the city, it also tells us something about the level of (or lack of) control that the incoming colonial power had at this point as well as the kind of knowledge and control they aspired to. It is unlikely that the British would have been able to obtain the authority to survey the city at this time and that could explain why they used an existing map to record (through text) the information that they required. They superimposed a layer containing a new kind of information on a map whose technique was suited to convey an idea about the city, but was insufficient where a more accurate situation needed to be known. Nevertheless, this map marks the beginnings of a search for new kinds of quantitative information about the city that eventually

necessitated the adoption of a new, Cartesian, geometrical system of map making. It also strongly brings out the close interaction between the adoption of new technology and changing map making trends, the political necessity for new kinds of information that warrant it, and state control over the process of collection, documentation, and cartography that make it possible.

'Shahjahanabad to Kandahar'

Figure 3 is an itinerary, a scroll map showing the route from Kandahar in present-day Afghanistan to Shahjahanabad, presumably made to facilitate trade and travel. A note on the back of the original gives the name of the author and dates it to 1814. However, internal evidence suggests that it was first made between 1770 and 1780 and the surviving map may be a copy made later[14]. Other maps of this kind have not been found as yet to establish if it formed part of any local cartographic tradition. It is reasonable to assume that the map was made somewhere in or around the area it shows -- this area was close to foreign settlements -- and it is likely that its maker would have at least seen European maps of Indian territory which had begun to be made by this time. However, the lack of any European cartographic influence suggests that despite the absence of any local tradition of map making which can lend context to this kind of representation, it is possible to conclude that it falls within the cartographic genre of other locally drawn maps of the time and illustrates some of the points that they do.

The map is long and narrow without consistency in scale or a sense of direction beyond progression from one halt to the next. It is almost a diagram. Important cities such as Lahore and Shahjahanabad are shown in some detail with walls, entry points, and the fort depicted symbolically. Intermediate halts such as villages, small towns, caravansarais, mosques, and residences prominent men are shown as gridded squares with some added symbol to distinguish between these categories; they are linked

[14]Gole, *Indian Maps...*, p 94. The surviving copy made by Maulvi Qulam Qadir in Kandahar is dated around 1814. It is not known if it was copied with the intention of use or as a historical record.

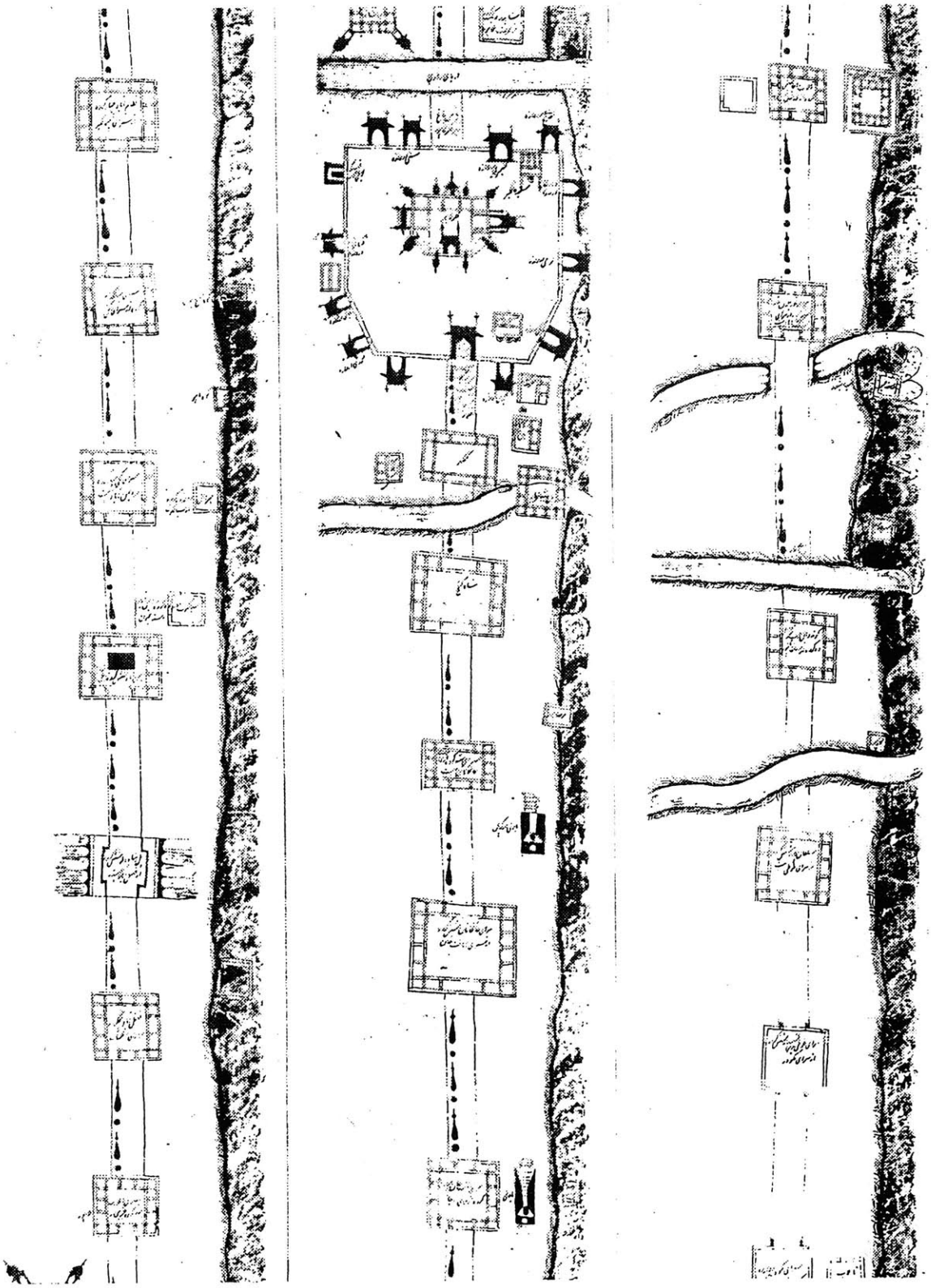

Figure 3. Shahjahanabad to Kandahar (part detail of scroll), c. 1770- 1780

together by a road; some landscape elements such as trees, hills, and canals that one might have to cross along the way are shown; rest houses and other landmarks such as wells that are at some distance from the route also find a place.[15]

This is a map of the surrounding landscape in which the viewpoint is on the ground rather than elevated above the land. It has been made by someone who wants to record his experience and encounters as he traverses the route; it progressively unfolds the experience of one element or space relative to another. Unlike a general map, it does not show an overview of the milieu that is indifferent to starting points or end points.

However, an itinerary such as this illustrates the sequential way in which linkages were understood and specific relationships perceived. While this contiguous linkage is instrumental in the case of this example which is specifically a route map, it is implicit in the two earlier maps where different sets of elements are understood in relation to a preceding set and despite the existence of all the elements in a single plane it is not possible to deduce relationships between any two other than those that are physically adjacent.

While it is problematic to put itineraries in the same category as general maps, the symbolic depiction of Shahjahanabad shown in **figure 4**, which forms part of the itinerary can be judged on the same terms as 'Fort and Streets' and 'Plan of Dehly'. In this detail, the shape of the city is more elongated than in the others, emphasizing the axial relationship between the Fort and the Lahore Gate through which the route passes. The main street of Chandni Chowk (again of disproportionate width) links them. This, along with the fort walls, a couple of other gates, two important mosques and an arbitrary system of internal roads constitutes the map. The same elements that recur in maps of the time serve as the icons to distinguish the city. As has already been noted, it's highly sparse character and pictorial representation points to a totally different understanding of the city and its components than later topographic maps.

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[15]Gole, *Indian Maps..*, pp 94-103.

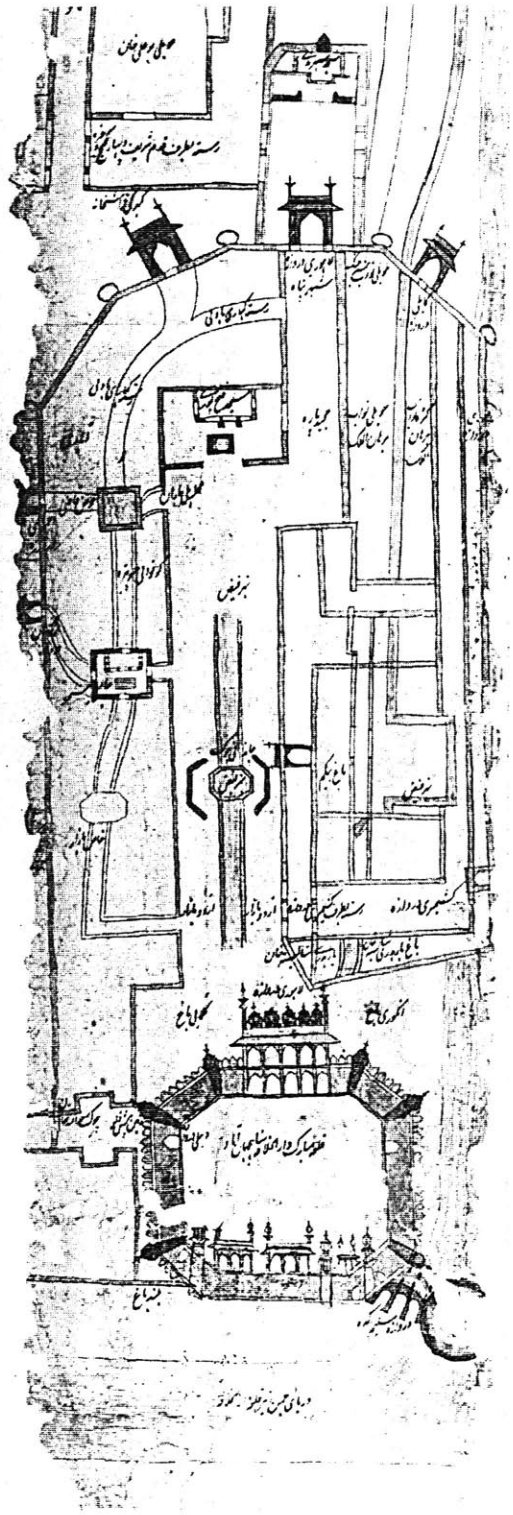

Figure 4. Shahjahanabad, From Mogul Route Map, c. 1770-1780

Illustrating the City Idea(l)

The cartographic technique that governed map making during this period was characterized by the absence of a Cartesian coordinate system underlying the representation. This precluded the awareness of the larger, overall context within which the given set of elements was set. The object in a system of this kind was examined on itself, from within -- as in the itinerary where observations are made from the route, or in 'Fort and Streets' where the viewpoint is of someone in the street. Characteristics such as connections, proximity, and enclosure between different elements were shown without involving a reference point outside the object.[16] Relationships between elements, unless made explicit through direct physical linkages could not be assumed or extrapolated. In other words, the plane on which the map was drawn did not denote or signify space, and therefore could not structure the relative association between elements within it by virtue of their location -- as a graph does to points on it. For example, the space outside the street in the 'Fort and Streets' (figure 1) or the space outside the walls in 'Plan of Dehly' (figure 2) did not mean anything and hence was not part of the represented spatial system.

A linear or contiguous understanding of relationships was a symptom of this lack of underlying structure or cartographic frame of reference. Linkages were perceived only through direct physical connecting elements such as roads and led to what can be described as a topological conception of represented space. The inability to denote a field of space made it impossible to visualize a conceptual whole in the absence its constituents. Sequence from one element to another established the structure of looking at and understanding space and relationships.

Such a topological understanding of space linkages was evident not only in representation but also in the building of Shahjahanabad. Each design act, whether it was laying out Chandni Chowk or building a caravansarai on it was made as an extension to an existing element that provided it with a reference. As mentioned earlier the city was built sequentially as a

[16]Robinson, *The Nature of Maps*, p 111.

composition of these features in certain relationship with each other. There was no conception of a desired overall pattern or whole that each move was building up to.

The match between the mapping technique that was known and the idea that required to be conveyed can be best brought out by contrasting the technique with the abilities of the subsequent one. The lack of a constraining underlying framework together with the lack of standardized or consistent symbolization rules, made it possible to exaggerate certain elements to bring out the iconic value that they had in the minds of the citizens. A Cartesian mapping system would not have been appropriate to convey this selectively built up image of the city nor be able to express its relative importance in the minds of map makers and their patrons.

The lack of factual and dimensional topographic accuracy also allowed the necessary subjectivity of representation in this phase that led to the establishment of the skeleton formed by the fortress and the main streets as the most identifiable image of the city. The accuracy of this representation was more a measure of an understanding of the relationship between and importance of these elements, than of topographic reality.

If the imperial image of Shahjahanabad was to be represented, the omissions as much as the contents played a role. While major public and royal spaces found a place in every representation, there is no evidence of the residential fabric or city elements that did not constitute the core. Internal streets are so ambiguous that it is obvious that they did not contribute to the dominant image of the city. *Mohallas* or housing quarters are not represented.

An alternate viewpoint of a city is provided in the maps of Nasik and Amber, shown in **figures ii and iii** (see pages 32 and 33). Drawn in the 1770's around the same time -- and with the same technique -- as the maps of Shahjahanabad were, their content and message is very different from that of the Delhi maps. Internal streets and individual houses are clearly represented. Neither city was an imperial center, which could explain the

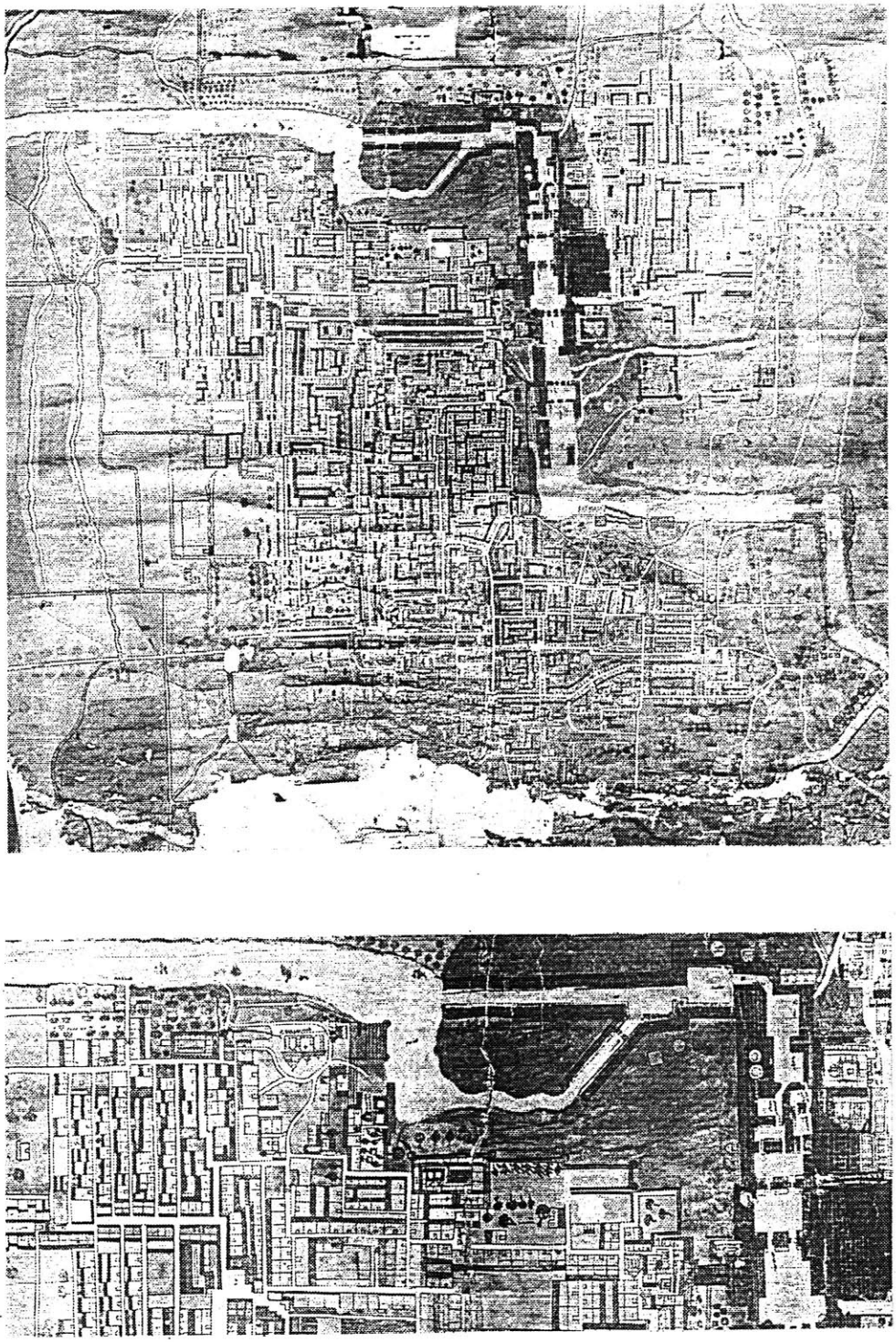

Figure ii. Nasik, c. 1760

Figure iii. Amber, 1711

greater awareness of elements other than royal or public premises. A definite interaction between the specific nature of the city and the choice of content and presentation in maps of Shahjahanabad is now clearly established through a comparison with these contemporary maps.

Chapter 2

MAPS AS INSTRUMENTAL KNOWLEDGE IN COLONIAL DELHI

The colonial period in Delhi -- 1803 to 1947 -- was marked by two important political transition points. One followed the Revolt of 1857, when the country was officially ceded by the East India Company to the British Crown. The second came in 1911, when Delhi was chosen as the site for the new imperial capital. Both these political events had a significant impact on the structure of the city. A new set of priorities -- regarding the physical and social development of the city -- replaced the old at both points, and led to new and different kinds of information to be incorporated into maps. For this reason, I have chosen to look at city development separately in these periods and see how map content and use changed within the colonial period itself.

The Ascending Elite: 1803 - 1857

The political fortunes of the Mughals started to decline in the mid eighteenth century. The massacre of Shahjahanabad in 1739 by the troops of Nadir Shah, the Persian invader, followed by a debilitating earthquake and famine, added to the misfortunes of the city and accelerated the virtual extinction of its political influence and imperial culture. There was large-scale migration from the city, of local population and high ranking nobles who had been dependent on the court for sustenance. By the end of the eighteenth century, Shahjahanabad was a shadow of its former imperial self. Despite the erosion of its political influence however, its potential as

an economic center due to its strategic location in the area and status due to its cultural and political heritage remained undiminished, and the city continued to maintain its reputation as a center of culture, grace, and style.

In 1803, taking advantage of the political instability of Delhi, General Lake of the British East India Company -- a colonial trading concern -- defeated the Marathas, restored the Mughal Emperor as the titular head, and assumed effective control, thus sowing the seeds of British rule in the city.

Socio-political Restructuring of Mughal Delhi

The first British Resident was appointed to be the 'protector' of the Mughal crown and a new political and economic structuring of the city was initiated. The socio-cultural system became less dependent on the emperor and old nobility, and shifted to Hindu and Muslim merchants, bankers, lawyers, teachers, and other professionals.[17] The administrative structure evolved based on a government system operating under the rule of law, and the European military and civil officer began to be recognized as a new and important actor. Market-oriented firms replaced the great households as the central economic institutions. Bonds of caste, craft, class, and ethnicity started replacing those between patron and client, and began to structure the nature of the *mohalla*, and the residential delineation within the city. The economic ascendancy and increasing security of the city began to attract the population that had abandoned it in the final decades of the previous century, and gradually the inner city started filling in. This growth was followed by an expansion of the suburbs, and by the time of the First War of Independence in 1857 (called the Mutiny by the British), Delhi was pre-eminent among the important and populous cities of North India.

The presence of the new culture resulting from military conquest rather than trade or diplomacy necessitated the accommodation of troops, besides administrative machinery. For reasons of space and security, the troops were stationed within the city walls. They occupied two areas north and south of the palace-fortress where, set in spacious grounds, were the now

[17]Blake, *Shahjahanabad...*, p 178.

abandoned mansions of the *nawabs* that along with the palace had formed the traditional core of authority in Mughal Shahjahanabad.[18]

All along the eastern and northern wall, in the area around Kashmere Gate and in Darya Ganj -- east of Faiz Bazar, were accommodated three military battalions along with a small hospital, a magazine, a gunshed, stables, and bazaars to supply the station with basic requirements. Qamar-al-din Khan's mansion near Ajmeri Gate became the Customs House, Dara Shikoh's mansion -- a huge ten-acre complex -- became the headquarters of the Resident, and other palaces to the north were renovated and converted to official use. To mark this change, the buildings were given a facelift as per the architectural norms of the incoming culture.[19]

Within four years of the conquest of Delhi, the pattern of colonial settlement centered around the former elite nucleus -- the palace-fortress and Kashmere Gate -- was well established. As the conversion of existing mansions started becoming inadequate for their needs, separate bungalows -- a new house form -- began to be provided for the accommodation of the growing breed of military and civil officers. These were located opposite the grand residences of the local *nawabs*, all along the northern and eastern walls of the city, in and around the area that had already been occupied for military use. While typologically very different from local *havelis*, these bungalows were also set in large open compounds, and formed a very low density residential texture invoking the ambience and spaciousness of past elite quarters.

The rise of a new colonial aristocracy

For the first quarter century after the arrival of the British, the growth of the city was confined exclusively to the area within the walls. In 1828, it was decided to move the cantonment or military establishment from the inner city to a new site just over the Ridge - a natural elevated rocky belt encircling the city and overlooking it, perhaps because of an increasing sense of security

[18]King, *Colonial Urban Development,* p 189. This area is outlined in dotted, in **figure 6.**
[19]This development is discussed in detail in Blake, *Shahjahanabad.*

about their position of control. Here, a large tract of land was taken over as suitable for a new establishment; the troops were moved to barracks laid out in a symmetrical matrix of huts or tents. Officers lived with their families in spacious, individual bungalows. Subsequent Residents, Agents, and other lower ranking officials too took the cue and moved out of the walled city. Fear, racial antipathy, social exclusiveness, and concern about health further intensified the creation of such an official aristocracy. Following the lead provided by them, Europeans who came in later to provide secondary and tertiary services and businesses, also took up residence in this newly developing, exclusively European suburb.[20]

Between 1830 and 1840, the development in this area steadily increased. The growing suburb came to be known as the Civil Station -- in close proximity to the cantonment and military areas but separate in function. The residential bungalow-compound was the basic unit of this settlement and the most distinctive characteristic of this phase, the role of the single residential unit in incremental city building.[21] For the first time in the city, an awareness of the residence became significant to the perception of the city and generative of its basic form. While this was true mainly of the European city composed of bungalows, the increasing indigenous population -- which was being accommodated in the western part of the city, where agglomerations based on caste, religion, and occupation started developing -- also started settling in tightly-clustered *mohallas*.

Where once social hierarchies were defined in terms of interaction with the palace, the emperor and the court, it now rested on income, class, caste, political clout, race, and ethnicity. For the first time in its history, there seemed to evolve for the city, more than just one dominant personality. The diminishing power of the imperial court gave rise to competing claims for importance and control from the incoming British, the rising class of Hindu and Muslim merchants and the growing European and Indian intellectual elite; the character of the city was no longer dependent on a single central institution but on several operating in parallel. The diversity that resulted

[20]The form of the new suburb can be seen in **figure 12.**

[21]Refer King, *Colonial Urban Development.*

made it possible to envisage multiple hierarchical strains within the same society.

It was but natural for the ascendant groups, particularly the new colonial power to assert their identity and importance; to establish a social legitimacy for themselves. During the initial period of the growth of the new colonial city, it was observed that the British tried to acquire a vicarious authority and popular influence by closely aligning themselves with the former imperial power, as -- despite the new composition of the city -- the Mughal emperor still commanded the respect and deference of the citizens. In spatial terms this was attempted by co-opting the areas of the bygone elite, and extending from it. Proximity to formerly established sources of prestige was perceived to enhance ones own, and location within the city became an indicator of the political importance of the occupant. The earliest British settlement came up around the palace, in some cases even in the premises of former princes' mansions. The earliest bungalows built were also clustered around this nucleus, as if to stake a claim to the status and tradition-based legitimacy and authority that the former occupants had. It led to a recognition of the social and formal hierarchies across the entire city, evident even on maps as physical features started taking on social connotations.

Map and Survey: A Fading Distinction

Simultaneous to the internal familiarization with the city was an increasing awareness and sensitivity of its location in the larger regional context. The nineteenth century was a period that witnessed the extensive documentation of the as yet unfamiliar topography, geography, and population of the country with a view towards facilitating administration and control. This effort was being undertaken on an enormous scale in the work of the Great Surveys of India. Initiated around the year 1800, the entire country was subjected to a comprehensive survey and documentation - from marine surveys to trigonometric surveys of physical geography, from meteorological to archeological surveys, and from astronomical to revenue surveys. **Figure iv** (see page 42), a copy of the index from Clement Markham's book on the Great Surveys of India, shows the scope of this enterprise.

The implications of such maps on the perception of cities was enormous. For the first time, cities could be envisaged and illustrated as a component of the surrounding landscape. A background to the existence of the city could be visualized and it could be seen in relation to regional resources. It contributed greatly to the idea of creating physical administrative units within the city and its vicinity for better control. It enabled the recording of physical data -- such as property ownership in the form of cadasters -- for administrative purposes and represented the attempt of the British to assume control through such knowledge; besides reflecting these intentions, for the first time maps started showing signs of being used as devices to store instrumental knowledge for furthering the larger territorial ambitions and geopolitical strategies of the colonial power. In this light -- of an increasing importance of surveyed information, -- the following maps are analyzed.

'Sketch of the Environs of Delhi'

The indigenous city of Delhi, shown in **figure 5**, which in the beginning of the nineteenth century was at the brink of becoming a nucleus of urban development over the next two centuries lay on the west bank of the river

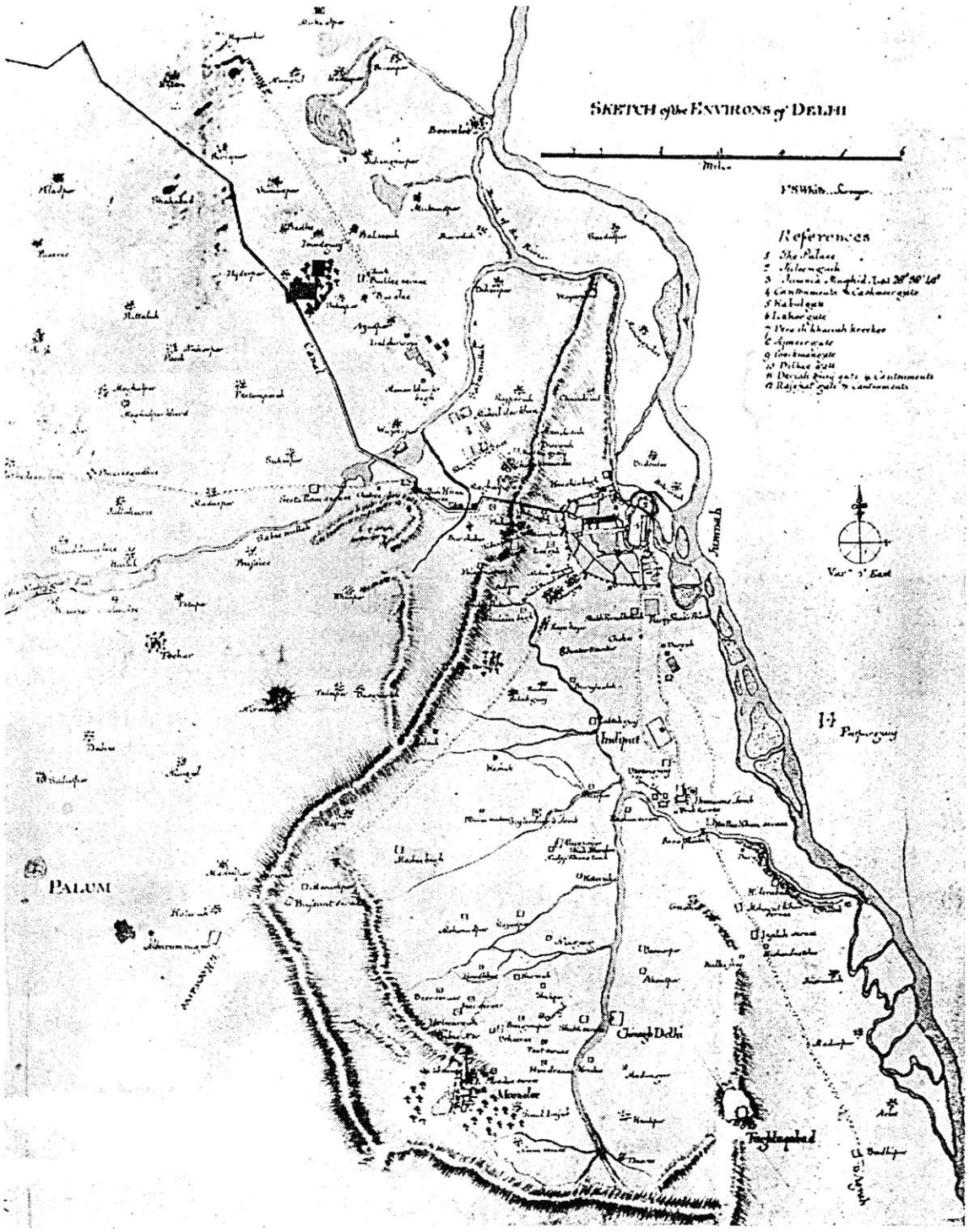

Figure 5. Sketch of the Environs of Delhi, 1807

CONTENTS.

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Figure iv. Table of Contents, "Memoirs on the Indian Survey", 1898

Yamuna. It was situated at the northern end of a triangle formed by the Aravalli ridges and the river, on the only route to India from the north west, irrigated by the Mughal canal, and in the vicinity of some 120 villages lying within a radius of 10 miles from the city.[22] This map was the first to locate these facts -- no doubt well known to all local people -- as one graphic body of information that helped put the strategic location of the city in perspective for its prospective rulers. The city in the mind of this map maker did not emerge out of it's fort and main roads and spread towards its walls as the city of Shahjahan had for its residents; it was contained and nested within the surroundings, itself becoming a component in the larger landscape.

Made in 1807, his is the earliest known European-made map of the city;[23] the earliest known attempt to place the city in its wider regional context. It was an official map perhaps used by the military administration to assess the vulnerability of the city and possible positions of control. The prominence of the ridge line encircling the city suggests the nature of information that was being represented. It appears to be a very early example of a series of maps that the British produced under the auspices of a newly set-up national Survey Department with the explicit intention of familiarizing themselves with different aspects of their new territory. Details of physical geography, local land-holdings, population, and topography were collected and illustrated in maps and statistical tables to assist in control over land acquisition, revenue fixation, administration, and eventually over a better informed physical expansion.

The following maps, made after 'Sketch of Environs' give a good indication of the kind of information about the city that began to be documented.

-*'Trigonometric Survey of the Environs of Delhi or Shahjahanabad'*, 1808
-*'Map of the Villages in the Province of Dihlee with general statistical tables'*
-*'Map of the Villages in the Province of Dihlee showing Panipat and Sonepat'*
-*'Map of Jaghirs and Possessions of Petty Native Chiefs in Delhi Territory.'*
-*'Map of Lapsed Jaghirs in Delhi.'*, 1865
-*'Country around Delhi.'* surveyed 1872 -74

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[22]King, *Colonial...*, p185.

[23]However, it was not the earliest map known to have been used by the Europeans. The copy of the indigenous map shown in **figure 2** was modified through text and used as a defense map a few years prior to this one.

The shape of the city is more or less accurate suggesting that a geographical survey of the city had already been done, but there is no level of detail in its rendering in 'Sketch of the Environs'. The intention of the map was clearly to embed the city in its physical context rather than look at its internal organization, in order to understand the relationship between the city and the regional features around it. However, this map has an added dimension to it beyond that of the topological maps of the preceding period. It has an element of scale and dimensional accuracy to it that follows from the adoption of a Cartesian representational system. It is interesting to compare the regional features shown in the itinerary (figure 3) with those shown here. In the former, while proximity and relationship of the route and intermediate stops to rivers, hills, and forests are indicated, the picture of the landscape over the entire area cannot be deduced. In contrast, the new technique used in the latter permits a truer structure of the landscape to be shown where several rather than only immediately contiguous relationships can be seen.

This map inaugurates the introduction of an underlying geographic structure[24] to the depiction, and the movement of the viewpoint from within the city to a point above it. This new cartographic technique, borrowed from European tradition of the time permitted a view of the entire city from a single vantage point, and for an authority that had territorial hegemony as an objective, the possession of such sweeping knowledge about the land encouraged a sense of power and potential control over it.

'Shahjahanabad'

This surveyed map, thought to be an indigenous map of Delhi and shown in **figure 6,** can be dated to a period between 1858, when much of the city was destroyed by the British following the 1857 War of Independence (the Mutiny), and 1803, when the British first gained control of the city. Some

[24] 'Structure' refers to the invisible field that cartesian geometry lays over the plane of the representation which dictates the geographic location of elements that need to be shown. This structure gives a geographical or locational attribute to every point on the plane and allows a deduction of the physical relationship between any two elements by a knowledge of their respective position on this field.

Figure 6. Shahjahanabad, c. 1850

scholars have narrowed the date to the decade following 1850.[25] It is unclear if it was produced for a specific reason, and neither author nor patron are mentioned in any of the existing records.

Labeled in Persian, but with a definite influence of European map making in it's precision and style, it has defied experts about it's origin. However, this is the first time that we see a detailed map of the city of Shahjahanabad; it is drawn with a degree of topographical and dimensional accuracy not seen before. Since it is so deviant from what little is known of local cartographic techniques of the time -- despite the Persian lettering -- it has been regarded by some to be the work of a foreigner, perhaps an Englishman. Even if it was made by a local cartographer, it could not have been accomplished without some reference to European techniques of survey and representation.

Streets, routes, points of entry, and internal blocks, so far shown iconically, sometimes selectively through a set of visually hierarchical symbols, now start taking their positions as constituent elements of the urban scape. The symbolization of various features is consistent with respect to dimension and scale within the map, and spatial hierarchies can now be read off it by comparison among consistently represented elements rather than projected through visual exaggeration of some parts. This is an important cartographic feature of maps of this period. It marks the beginning of the true recording phase of map making as opposed to the interpretive one. This map is among the earliest (if not the first) to inaugurate the phase of a systematic and extensive documentation of information about the internal components of the city, just as the previous map had done with the regional landscape. Accuracy with respect to scale and dimension became critical and established the importance of the accumulation of surveyed information as the base and input for development and expansion, administration and control.

The emergence of a more accurate depiction of 'texture' is another significant characteristic of this map; it was one of the first maps to show a

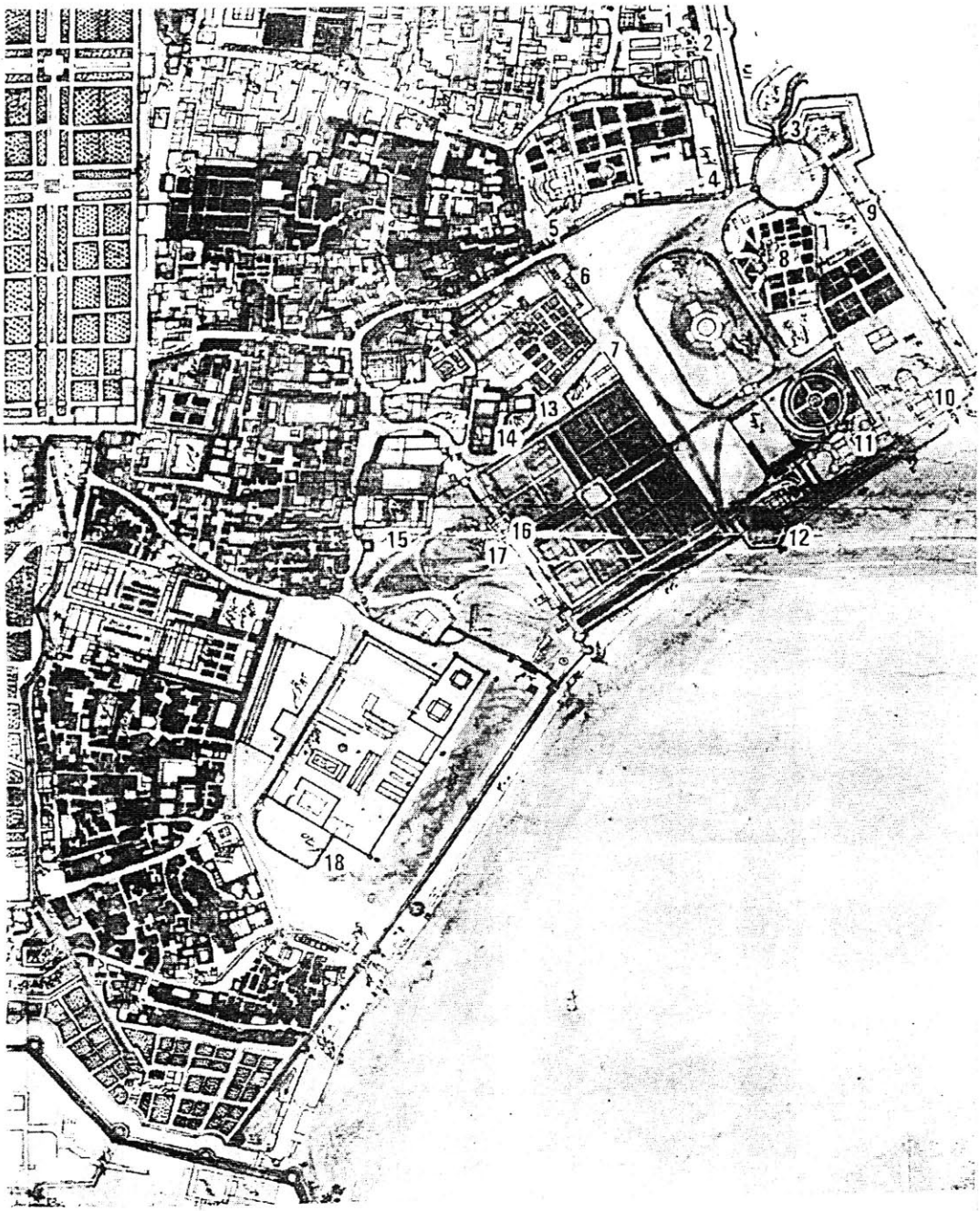
[25]Gole, *Indian Maps...*, p 177.

relationship between open space and built form to build a picture of streets, squares, courtyards and built mass. An observation of the map shows the block represented as a shaded mass within clearly defined secondary, internal streets; important mansions are shown in relatively greater detail with courtyards, entrances, boundaries, and landscape elements outlined. The physical environment of different areas in the city can be understood and extrapolated from the information on the map. The map is widely published and is used even today to study the physical character and density of the city at that time.

Despite its increasing physical and social diversity, the perception of the city as a single entity with comprehensible boundaries was reinforced. It was recognized as a composition of all its aggregate parts rather than perceived through a few dominant elements. The representational technique used (objective, documentary, and with an underlying geographic framework) augmented this perception and became the most significant transformation in the representation of the city in this period.

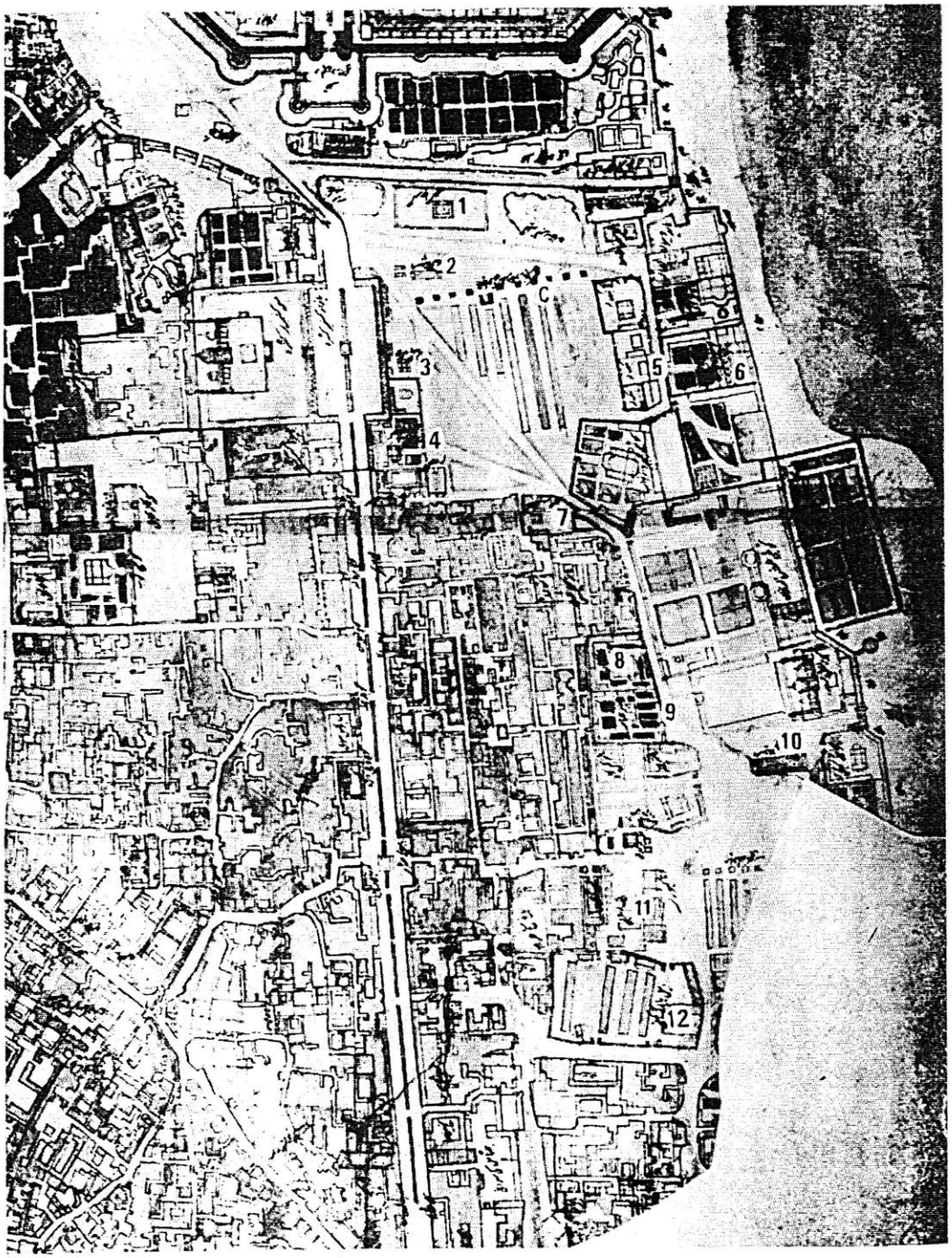
Figures 7 and 8 (see pages 48 and 49) are enlargements of Figure 6, showing the area north and south of the palace-fortress where the initial colonial settlement grew up. The texture of the map accommodates within it a delineation of the residential urban fabric seen for the first time in Delhi. ` There is a quality to the map that now permits a comparison between the old city and the newly emerging one at the level of residential texture and density. Indigenous *mohallas, nawabi* mansions, and the new colonial development become increasingly distinguishable from each other on account of the difference in their physical character.

As an awareness of the physical and spatial nature of areas of differing social importance increased, as they started being recognized and compared, their attributes -- such as density, size of individual properties, access to open space and gardens, and other resources -- began to be endowed with a certain social status. It permitted the possibility of extrapolating the social character of a place by looking at a depiction of its physical attributes. With the representation of different types of areas having different physical



1 Bungalow (?) sahib
2 Bungalow (?) sahib
3 Kashmiri Gate
4 Stable
5 House of Sekundar (Skinner) Sahib
6 Company barracks
7 Bungalow (?) sahib
8 Foster Sahib's compound
9 Guard
10 Treasury (?)
11 House of Smith Sahib
12 Printing House
13 Post Office
14 Hospital
15 Kutcherry
16 Residency
17 Residency house
18 Graveyard

Figure 7. Indigineous plan of Delhi, c. 1850; section on Daryaganj enlarged



C Chownee Daryaganj (Daryaganj Cantonment)
1 Christian church
2 Hospital
3 Dak bungalow
4 Godown
5 Bungalows (three)
6 House of Padre Thomson
7 Surgeon's bungalow
8 Bungalow
9 Bungalow James ? sahib
10 Hospital
11 Sergeant's (?) or Surgeon's (?) bungalow
12 B (?) Company Barracks

Figure 8. Indigineous plan of Delhi, c. 1850; section on Kashmiri Gate area enlarged

attributes, maps became a window to compare areas not only physically but in terms of social hierarchy as well.

This was a period of addition and extension to the city with the location of newer parts being justified in terms of benefits of association or disassociation with existing parts. Income levels, political importance, social class, and other socio-economic attributes of the population which had become associated with certain kinds of spatial densities now began to be read off the map without being stated explicitly and began dictating the desirability of certain locations, from aesthetic, strategic, and social points of view. For example, in figure 7, some British additions such as the Christian church (1), hospital (2), and bungalows (5, 7, 8, 9), located just south of the palace (seen at the very top of the map) with spacious grounds around them evoke a very different, and by virtue of their density and location, a more privileged physical and social environment than the indigenous courtyard-house settlement clusters shown at the bottom left corner of the map. Similarly in figure 8, House of Skinner Sahib (5), Foster Sahib's compound (8), House of Smith Sahib (11), and the Residency House (17) to name a few colonial mansions, as well as a few indigenous ones, appear to be more important and prestigious compared to the tightly clustered *mohallas* around it because of the well-developed gardens in their compounds, the grounds surrounding it, and the spaciousness and size of the residential complexes.

Now that indications of social or political importance could be deduced from formal attributes and physical and social proximity to established sources of prestige, information that could support such inferences began to be reflected in graphic form; it provided a context for the design and planning of new areas, especially extensions by the British. Social attributes of spatial structures and spatial attributes of social groups appeared to crystallize in the minds of the powers controlling growth and indirectly maps that were repositories of physical data started containing related social information.

The added dimension of geographical structure a vantage point that allowed an all encompassing view of the city were the characteristics of the new cartographic ethic. It allowed a perception of the city as being composed of different parts in a certain relationship, just as it allowed a perception of the city as being a part in the overall landscape. It also gave rise to a new form of representation not commonly used to map cities in India -- the bird's eye view.

'Panorama of the Walled City of Delhi'

The view in **figure 9** (see page 52), presumed to be made in 1856 is an early example of such a map. The maker of the map is not known; it was published in the *Illustrated London News* in 1858 and was most likely commissioned for this purpose. Though underestimating the density of building within the city, this view provides a reasonably accurate picture of the walled city to the members of the ruling elite for whom it was produced. It indicates the palace (1), the main mosque (2), the central bazaar (3), and the main institutions of the immigrant culture such as the Custom House (4), the church (5), the 'Magazine' (6) and the *Jail* (8). Significantly, it also shows the nature of the landscape outside the city walls even if it is pictorial in nature.[26]

Despite the radically different form of representation, it is conceptually similar to the topographic plan view shown in 'Shahjahanabad' (figure 6). Although bird's-eye views such as these cannot be considered part of the genre of maps that strive for objectivity and documentation (moving away from preceding symbolic and subjective maps), they do address some of the concerns of topographic maps. For instance, representationally the map does not appear to privilege some city elements over others and is relatively objective in the depiction of various elements within the city, despite being in the pictorial mold.[27] As in the plan, a vantage point somewhere above the city is established from which the entire milieu can be observed. Their

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[26]King, *Colonial..*, p 205.

[27]In contrast however, **figure v**, on page 53 (which is more a painting than a map-view) reflects the prevalant visual and mental experience of 'oriental magnificence' where certain features are enhanced over others in order to illustrate an image.

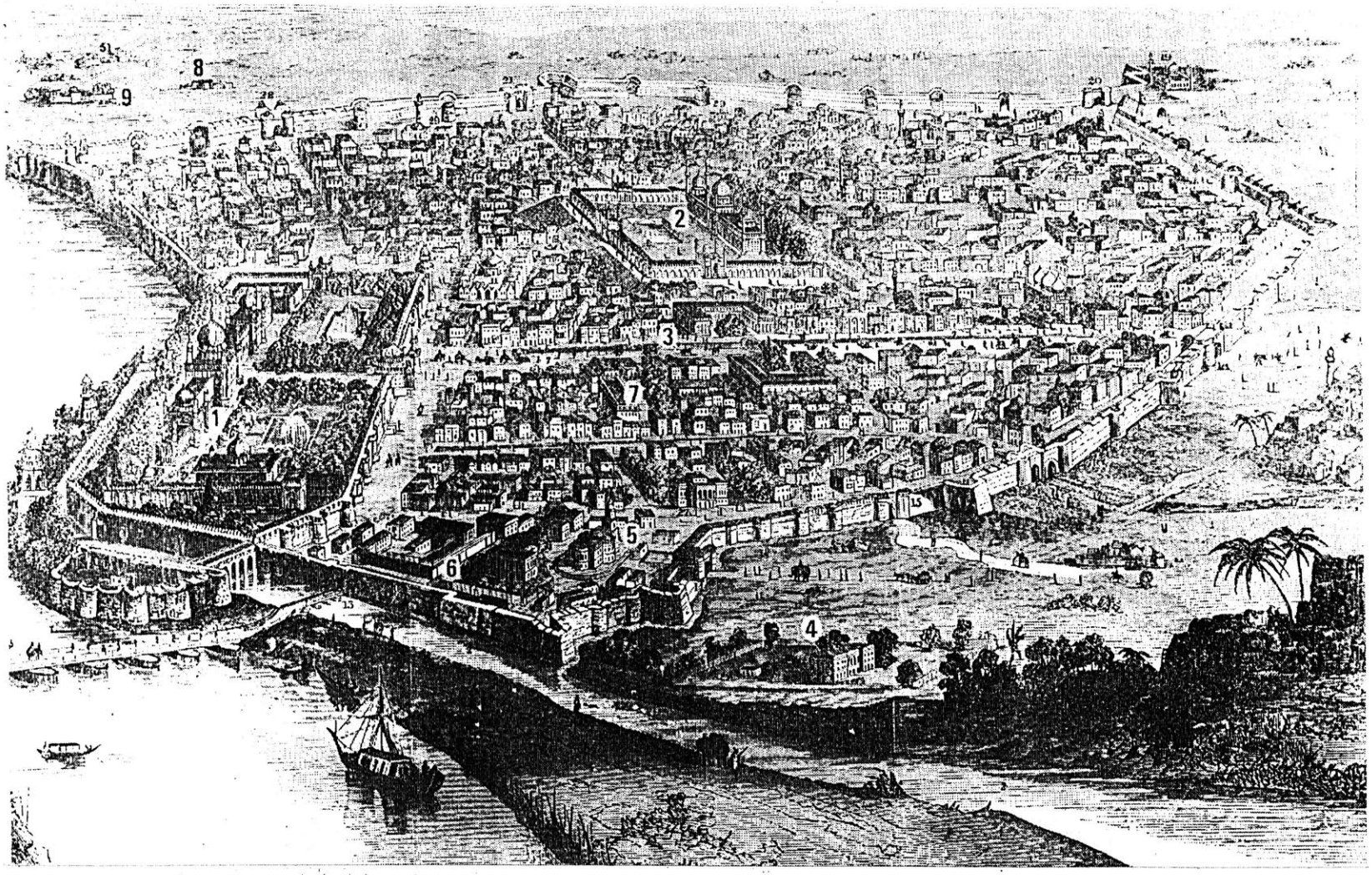


Figure 9. Panorama of the Walled City of Delhi, c. 1856

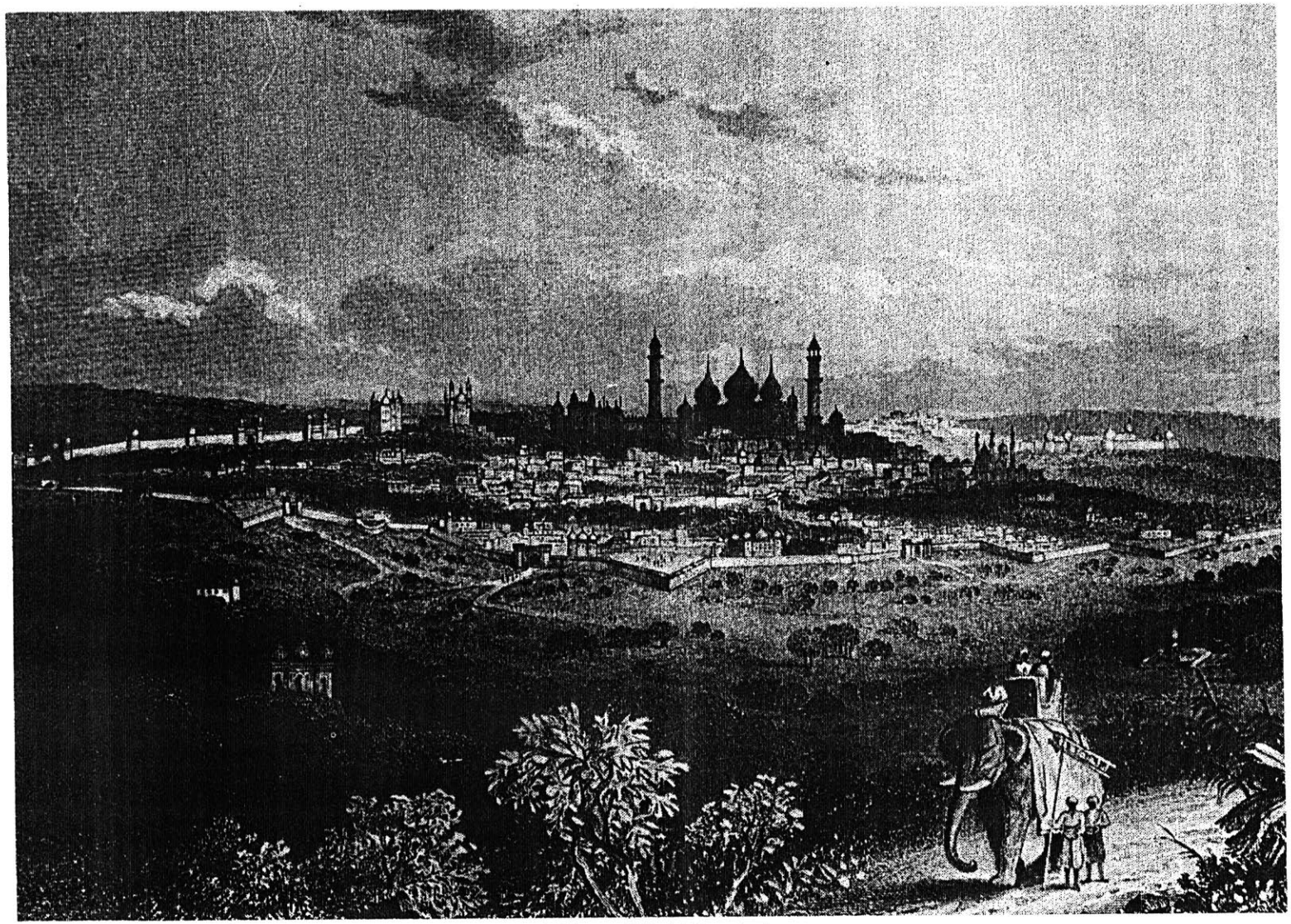
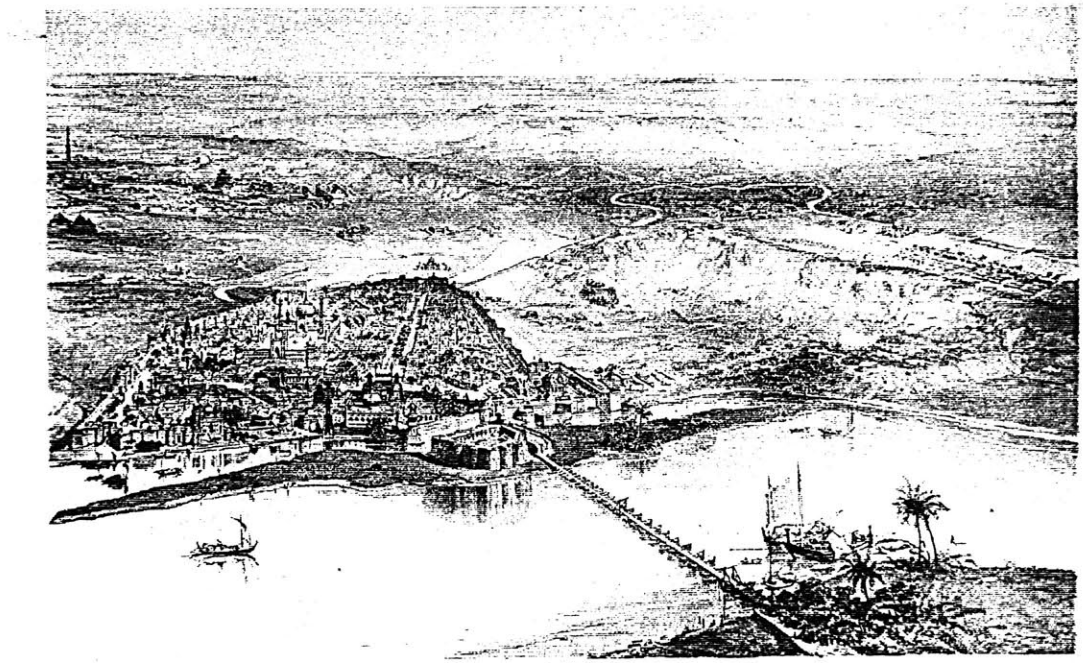


Figure v. View of Shahjahanabad

emergence at the same time as the appearance of surveyed topographic maps show clearly the compulsion to understand different parts of the city from a single perspective.

The arrival of the British as the controlling power had a powerful impact on map making tradition in the country. We have already seen the beginning of a systematic documentation of the physical features -- landscape and built -- in and around the city since the colonial power first established its presence in Delhi in 1803. This corresponded to an extensive documentation of the entire country under the Great Surveys of India; It was the belief that knowledge about the land would enable a control over the environment and the creation of a role for surveyed information as a prerequisite for effective administrative control and as an input for development was foreseen. The strategic advantage of and need for the bird's-eye view or up-in-the-air viewpoint, the importance of dimensional accuracy and scale, and the role of documentation becomes most evident following the unexpected military uprising in 1857.

'Delhi and Surrounding Country' *and* ***'The City of Delhi and its Neighbourhood from the English Position'***
are the names of **figures 10** and **11**, and illustrate the recognition of this point. Both were drawn in 1857. While the identity of the maker is not known, it was most likely commissioned by the colonial power -- perhaps the military establishment. It shows the city of Shahjahanabad from two directions. In both the views, the relationship of the British forces and arms and their location with respect to the city is prominently shown. A knowledge of the city, the topography around it and the relationship of parts of the city with each other and with the surrounding landscape in terms of accessibility, proximity, and vulnerability became essential once again to the suddenly threatened colonial power. The event provided a fresh impetus to the establishment of a potential for control through graphic documentation and monopoly of knowledge about the city that would continue well into the next period. The following section illustrates post-1857 developments and discusses the accompanying change in map information.



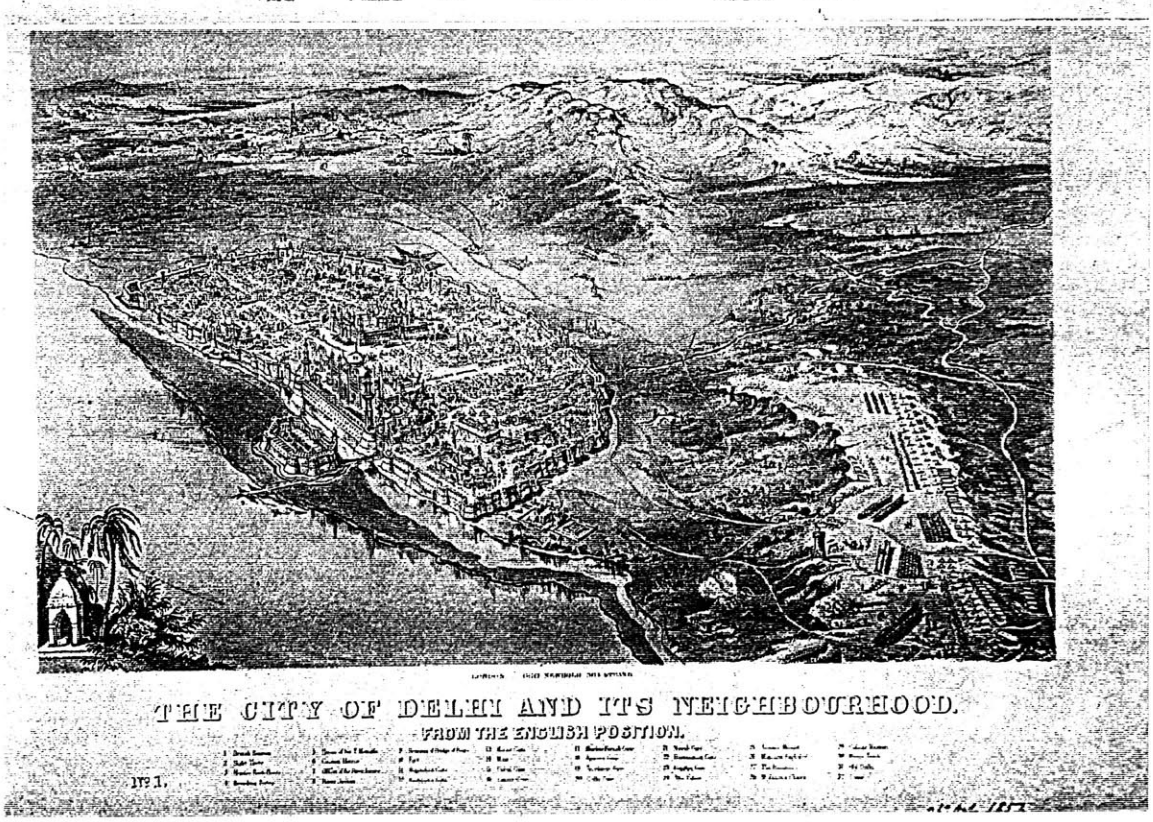


Figure 10. Delhi, And Surrounding Country, 1857
Figure 11. The City Of Delhi And Its Neighbourhood From The English Position, 1857

The British Raj: 1857 - 1911

The conflict of 1857 formally ended the Mughal Empire in India and inaugurated the beginning of the British Raj. The Emperor was exiled and the palace-fortress taken over. The cantonment, which had been moved outside the walls in 1828, was brought back into the city and was located in an area enclosed on three sides by the city wall running from Kashmere Gate, down the eastern wall and round to Delhi Gate. On the west, the boundaries enclosed the entire area of the former *Begum Bagh*, and ran south encompassing the area on the fortress side of Jama Masjid all the way down to the city wall. All around it, a strip of territory 500 yards wide was zoned for military use. Most of the buildings within the fortress and in the area appropriated for the cantonment were either demolished or seized by the military establishment. Property was confiscated, and houses, mosques, and commercial establishments taken over; nearly one third of the spatial area of the city was destroyed for the accommodation of the cantonment and a further 500-yard security zone was set up all round the city where neither building nor agriculture was permitted.[28]

There was widespread slaughter and the entire surviving population, both Hindu and Muslim, was driven out of the walled city. Between 1857 and 1861 the city was under absolute control and occupation of the British Army. In 1861, the town was returned to civilian authorities and the rebuilding of Delhi on the framework of a battered Shahjahanabad began. The indigenous population that had been expelled from the city were allowed to return gradually; strict control was maintained on the nature of social and physical development of the city; most city building decisions and activity officially passed into the hands of the new rulers and a drastic modification in the structure of the walled city and its immediate environs was initiated.[29]

A combination of two reasons characterized the nature of the growth imperatives of the newly emerging 'second' colonial city. Anthony King,

[28]King, *Colonial...*, p 210.
[29]Gupta, *Delhi ...*, p 70.

in his book *Colonial Urban Development* defines these two main variables that affected Delhi's physical and social development following the 1857 conflict, as those of the power relationship of colonialism and the introduction of 'metropolitan technology' into the city.[30] The former was characterized by the absolute control and monopoly of government over the entire city by the British Crown, and the latter by the strengthening of the emerging mood of social and economic development and debates regarding public health and sanitation that had taken hold of the city, and led to new and enhanced expectations of city and city life.

Spatial restructuring under colonial control

The effect of the first of the two variables -- the unqualified authoritarianism of the colonial power and its ability to effect changes at will -- had important effects on the socio-spatial structure of the city. Tendencies already apparent before 1857 were aggressively pursued. European troops were strictly segregated from indigenous ones. Most European civilians moved out of the walled city to the rapidly expanding Civil Station. By 1867, there were thirty new European solid-masonry bungalows established in and around this area, each with the characteristic two-to-three acre compound, stables and servants' quarters. With the growth of the Civil Station, came the induction of recreational, religious, economic, educational, and other social institutions of the immigrant community. Wide tree-lines roads accessed the colony and a new grain of development started appearing around the city of Shahjahanabad.[31] A new elite enclave was in the process of being formed.

Members of the indigenous elite, who had been displaced by the post-Mutiny demolitions were accommodated in plots on either side of Chandni Chowk; others were packed into the 'native' sector within the walls or moved to the cramped suburbs of Paharganj, Sadar Bazar and Sabzi Mandi outside the walls to the south and west of the city.[32] In sharp contrast to

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[30] King, *Colonial...*, p 209; Introduction of 'metropolitan technology' refers to the installation of service systems such as transport, water, sewage, electric and social infrastructure networks.

[31] King, *Colonial...*, pp 209-211.

[32] King, *Colonial...*, pp 209-211.

the British Civil Station was the condition of these indigenous suburbs. Described in 1913 as "a collection of mean houses occupied as a rule by lower castes"[33] they consisted of crowded mud-brick houses, very different in character from the ambience of the Civil Station. While some concerns were voiced about the condition of life in these areas, they were by and large bypassed in the provision of city amenities and resources which were diverted towards the privileged suburbs to the north.

Within a few years after 1857, Delhi had two culturally and functionally distinct areas - one colonial, mainly military and administrative, and one indigenous, mainly residential and commercial. Segregated culturally, they represented opposite poles in terms of political favor and access to resources. Disparity increased with greater attention being bestowed consistently upon one, and a network of resources and amenities began to form around the germinating elite nucleus. Unlike the phenomenon of suburbanization in contemporary western cities, these suburbs of Delhi did not develop as a result of new forms of transport or unequal distribution of wealth but by the "introduction of new cultural values and an allocation of resources made possible through colonial control."[34]

The mood of social improvement

The effect of the second variable -- the emergence of a scientific rationale in evolving a desirable quality of urban life and the adoption of technology to attain it -- was almost as great as the impact made by the military presence and the new political alignment on the development of the city.

Towards the beginning of the second half of the nineteenth century, a change began to occur in the level of expectations that the colonial population had of their living environment. A higher life expectancy, decreased rates of morbidity and disease, and lower death rates for the inhabitants became important concerns; this new consciousness was propelled by the diffusion of new forms of knowledge from the incoming

[33]King, *Colonial...*, p 228; (quote from Punjab Government, *Gazetteer,* Delhi, 1913, p220).
[34]King, *Colonial...*, p 208.

culture. Various theories concerning the interaction of man with his physical surroundings, especially related to health and sanitation, spread and induced new perceptions of city and city-life. Developed in the context of urban environmental change brought about by the new processes of urbanization, these theories not only raised a different set of expectations but also new criteria for the accommodation of urban populations.[35]

A new ethic based in science and technology -- provision of light, water, fresh air, sufficient space, transport, waste-disposal and drainage systems -- developed, with which these criteria could be inducted into city building. Simultaneously, new social institutions were developed in the form of administrative and governmental organizations. Concepts of local government and development authorities were invented or reorganized, improvement commissions were instituted, and voluntary organizations were set up to cope with the increasing social problems generated by urban growth.[36]

This mood of social improvement had in fact been gathering momentum for the past three decades. As early as 1817, there was a proposal to drain and clean the Najafgarh Jheel -- a canal that ran through the city and carried much of its waste water -- as it was believed to be the source of most of the common Delhi diseases. Even prior to this, in 1810, a proposal to reopen the Ali Mardan (Mughal) Canal resulted in an official survey; funds were set aside for the purpose and provision of healthy and safe drinking water for citizens was cited as a priority.[37] In 1824, the Town Duties Committee was established which was perhaps the first improvement and development agency of the government in Delhi. It earmarked town duties for local improvements and even suggested that direct taxes be levied for this purpose.[38]

In the 1850's many ambitious development schemes were proposed. There were proposals for the Grand Trunk Road -- a major highway and trade

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[35]King, *Colonial...*, pp 102-103.
[36]King, *Colonial...*, pp 102-103.
[37]Gupta, *Delhi...*, p 19.
[38]Jain, A. K.,*The Making of a Metropolis,* p 66.

route -- to pass through the walled city, reclamation of land under the ditches near Mori Gate, revamping the drainage system, linking Delhi with the railways, and decongesting wholesale markets within the walled city.[39] The period between 1857 and 1909 is considered to be the era of the great Improvement Schemes for the city. In 1863, the Delhi Municipal Committee was formed to oversee the development of the city and was given the authority to raise revenue for its activities. In 1874, it was given control of public lands upto a 3 mile radius around the city. To have a measure of control over the increasing building activity, the Committee set up building byelaws in 1881. In 1866, the railway lines and station were constructed within the walls and in 1867 the first train steamed into Delhi. Between 1890 and 1910, a new water distribution system was installed leading to piped water supply for residents. Electric street lighting was introduced in the walled city in 1901. New railway and road lines followed and by 1905 Delhi was a major commercial capital. In 1895, sewers were built in the Chandni Chowk area and by 1910, they were even servicing parts of the indigenous suburbs.[40]

These developments should be evaluated in the light of values that British officers of the time brought to India. 'Improvements' was a popular Victorian term and idea in contemporary England and was bound to be part of the mental make-up of newly arrived British bureaucrats.[41] Public works carried out under the 'improvements' banner in Delhi often tended to supplement British trade or the colonial self image. Nevertheless, the philosophy did lead to several beneficial modifications in the walled city and to a perception of it (primarily by the British) as a useless maze that needed to be regularized. In 1910, the Municipal Committee commissioned A. U. Wilson for a survey of the Walled City and a set of detailed maps were produced;[42] eventually these maps -- that came to be known as the Wilson sheets -- were to form the basis of the development of the first Master Plan for Delhi in 1962.

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[39]Jain, *The Making...*, p 67.
[40]Jain, *The Making...*, p 71; King, *Colonial...*, p 218.
[41]Gupta, *Delhi..*, p 84.
[42]Jain, *The Making...*, p 72.

The Representation of Information

Stored in census data, reports and tax registers, results of socio-economic analyses began to become as important an input in thinking about the nature of the city as topographic data. The introduction of new infrastructure, the creation of culturally segregated enclaves and the developing relationship between them -- the events that primarily characterized the growth of the city in this period -- can be understood only against the background of these developments. Partly resulting form these technological social innovations and partly from the political processes of colonialism, the immediate urban region of Delhi was greatly extended and led to a new, more complex, and interdisciplinary perception of urban growth and the city. Maps began to respond to this and started accommodating new kinds of information besides that which had already been established in the previous period.

'Plan of the British Position at Delhi, 1857'

Shown in **figure 12** (see page 62), this map was made by the British government after a survey of the city following the 1857 uprising and can be considered part of the large body of survey maps that had the explicit intention to document the city, assess the current situation, and establish a base for future administrative and developmental operations.

There are more kinds of information on this map that even in the 1850 detailed topographic map of Shahjahanabad. It is almost a combination of the 'Sketch of Environs' (figures 5) and 'Shahjahanabad' (figure 6), showing both built form and surrounding features. The surveyed content of the built form and the landscape is completely integrated with a representation of what might constitute the city and manifests the newly emerging sensitivity to local topographic conditions. It is an early example of a series of maps that started being produced of the walled city and the incremental development of the Cantonment (military establishment and barracks) and the Civil Station along the ridge. The map is a snapshot in time of the early phase of colonial expansion. As was the case with the early bungalows along the palace, it is evident that the new areas have been

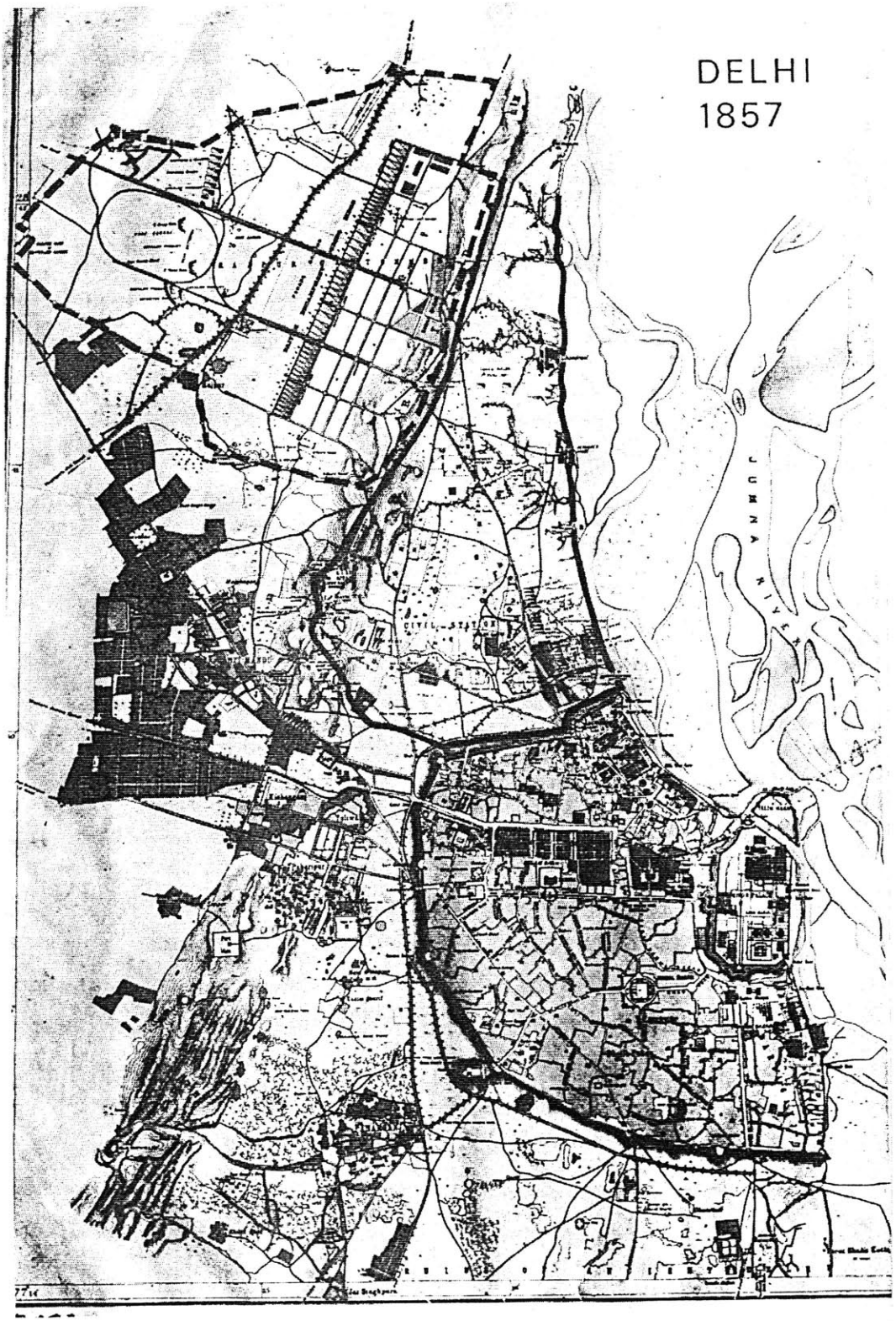


Figure 12. Plan of the British Position at Delhi, 1857

placed in a system of hierarchy with respect to existing areas. The knowledge that a plan of this kind contains, allows the observer to make a premise about the existence of a spatial hierarchy within the city as seen in the proximity to natural and city resources, distribution of space, grain of residential development, distance from 'congested', 'indigenous' areas etc. and permits a planned organization of residences and administrative areas of the newly emerging city based on such information.

This kind of map knowledge was significant considering the direction colonial urbanism was to take. The city for the incoming population consisted primarily of residential colonies. The creation of a social hierarchy based on the allocation of space, resources and locality with respect to emerging residential and administrative areas was a characteristic feature of the time. This was paralleled by a recognition of the individual residence as a legitimate module and the new paradigm in the creation of urban form; the emergence of a finer grain of texture to depict built form was resonant with this emergent sensibility.

Moreover, the prevalent mood of social improvement resulted in investigations into various aspects of the environment and its interaction with the population, with the eventual objective of setting standards and criteria for urban growth.[43] It is relevant to see 'Officer's Houses and Lines, 14th N.I. at Bangalore' and the volume-of-air-per-person diagram from Godwin's Town Swamps and Social Bridges (1859) shown in **figures vi** and **vii** (see page 65), in this context. The compound in which each house is set is as important as the house itself. Besides the prestige associated with a more spacious residential setting, the size of the compound is also justified through the diagram shown below. These two figures reflect both the perception of the free standing residential module aggregating to form the larger colony or city as well as the nature of additional concerns relating to air quality, congestion, and health that began to have a role in shaping the living environment and through it, the city as a whole.

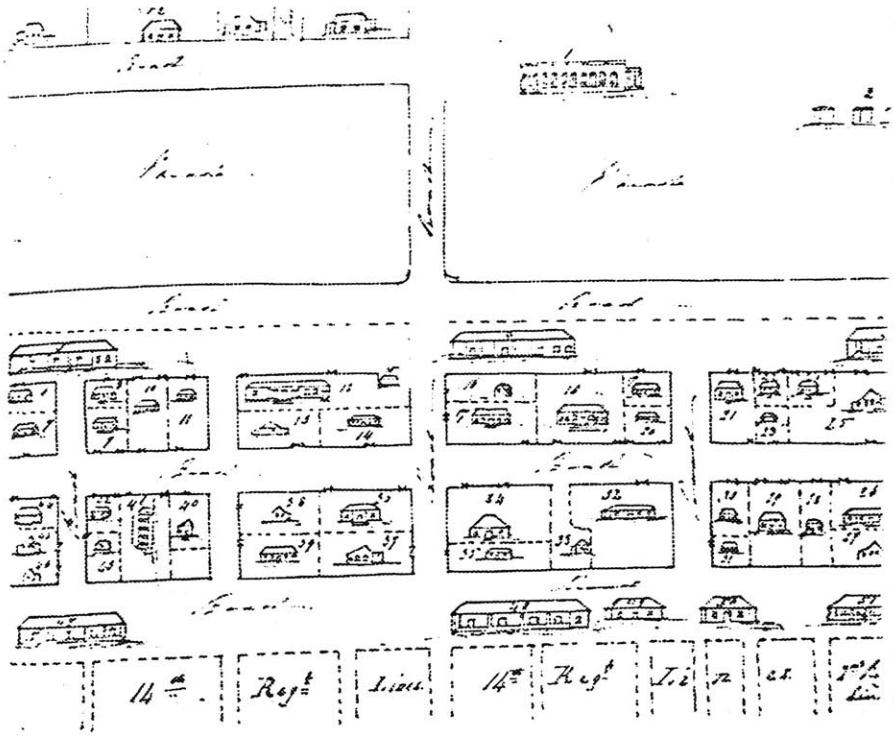
[43] King, *Colonial...*, pp 102-103.

Maps increasingly began to reflect some of these factors and became complex storehouses of information; at the same time they became powerful symbolically, reflecting the values that were causing the changing perceptions of and expectations from the city.

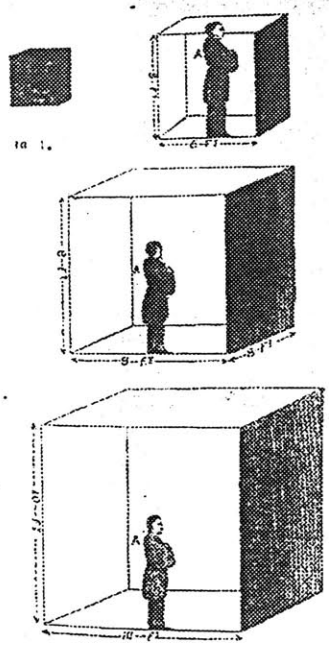
'Map of Delhi and Vicinity,' I and II

The two maps shown in **figures 13** and **14** (see pages 66 and 67) were drawn in 1912 following a survey of the city and explicate this point. These maps push the effort that had begun to be evident in the 'Plan of the British Position at Delhi' shown in figure 12. Unlike it, these maps show a profusion of things in the background -- in the land surrounding that which has been taken over by the built city. Physical features such as built fabric, transportation lines, and monuments (labeled as such) are visible but there also seems to be an additional layer of information. Unfeatured open land around the built zone has started being understood as such due to the new cartographic system unlike maps such as 'Fort and Streets' and 'Map of Dehly' (figures 1 and 2), where space around the representation did not necessarily denote open space. Furthermore, symbols differentiate open space by physical character and use; contours, plot boundaries, and a field of small markings (top right corner in figure 14) representing agricultural land are seen. Topography, ownership, and landuse is now seen on the same representation through a juxtaposition of different symbols.

The grain of these maps now results not only from the true denotation of the physical characteristics of the environment but from a method of overlaid symbolization corresponding to the use of the place. Whereas earlier all surrounding open space was shown similarly, we can now distinguish between open space that is used for agriculture from that which is marshy; between space that is not under specific ownership to that which has been parceled; between open space that has not been earmarked for development from that which has. Access routes now begin to get differentiated in terms of access modes. Areas of similar physical characteristics now begin to display attributes depending on present or possible use



The annexed figure (1) drawn to scale, represents the 14 cubic feet of air which are used up per hour by each individual. This quantity of air, when returned from the lungs, exhausted of the vital element oxygen, is charged with carbonic acid to such an extent that it vitiates to a great and poisonous degree 100 cubic feet more of air.



The adjoining sketch, drawn to the same scale as the former, contains 125 cubic feet of space, which is more than is provided for those living in Rose-alley and many other places to which we have directed attention. The figure A is a man of ordinary size compared with the cubic space provided in the dwellings in the alley; and when we consider that in the St. Pancras dormitory, where 164 cubic feet were allowed to each person, Dr. Jones found that the air contained about thirty times its proper amount of dangerous carbonic acid,—as a matter of course the air in the dwellings in Rose-alley must be in a dreadful state of poisonous adulteration.

The next drawing represents a cubic space of 512 feet, a trifle more than the quantity allowed in the best of the London barracks.

The last engraving shows the proportion which 1,000 cubic feet bear with the above, and is the amount of space allowed in several hospitals. Even this is insufficient, without other arrangements: indeed, with 2,000 feet impurity gets in excess.

Figure vi. 'Officers' Houses and Lines, 14th N.I. at Bangalore
Figure vii. Diagram showing percapita volume of air required

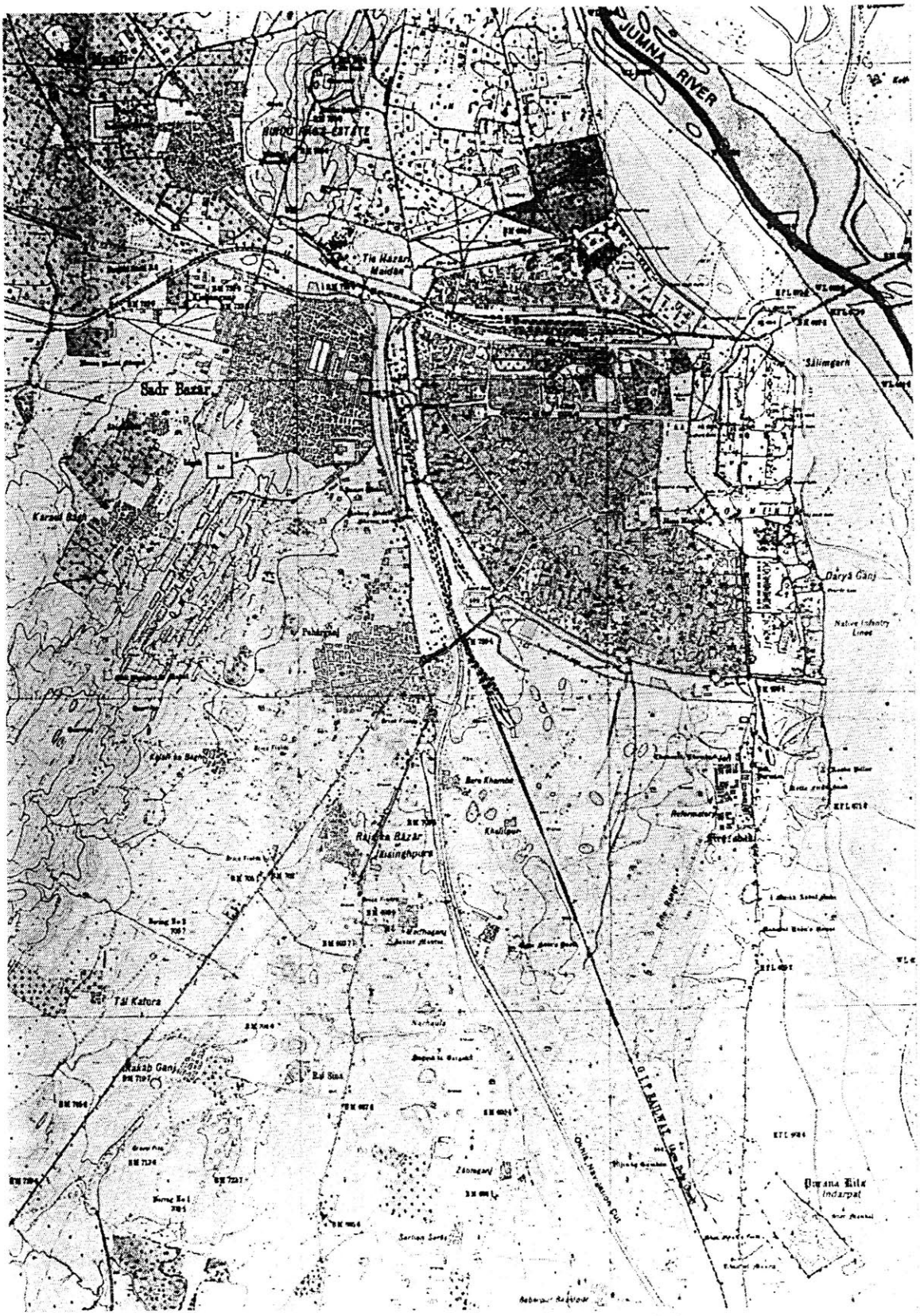


Figure 13. From Map of Delhi and Vicinity, 1912

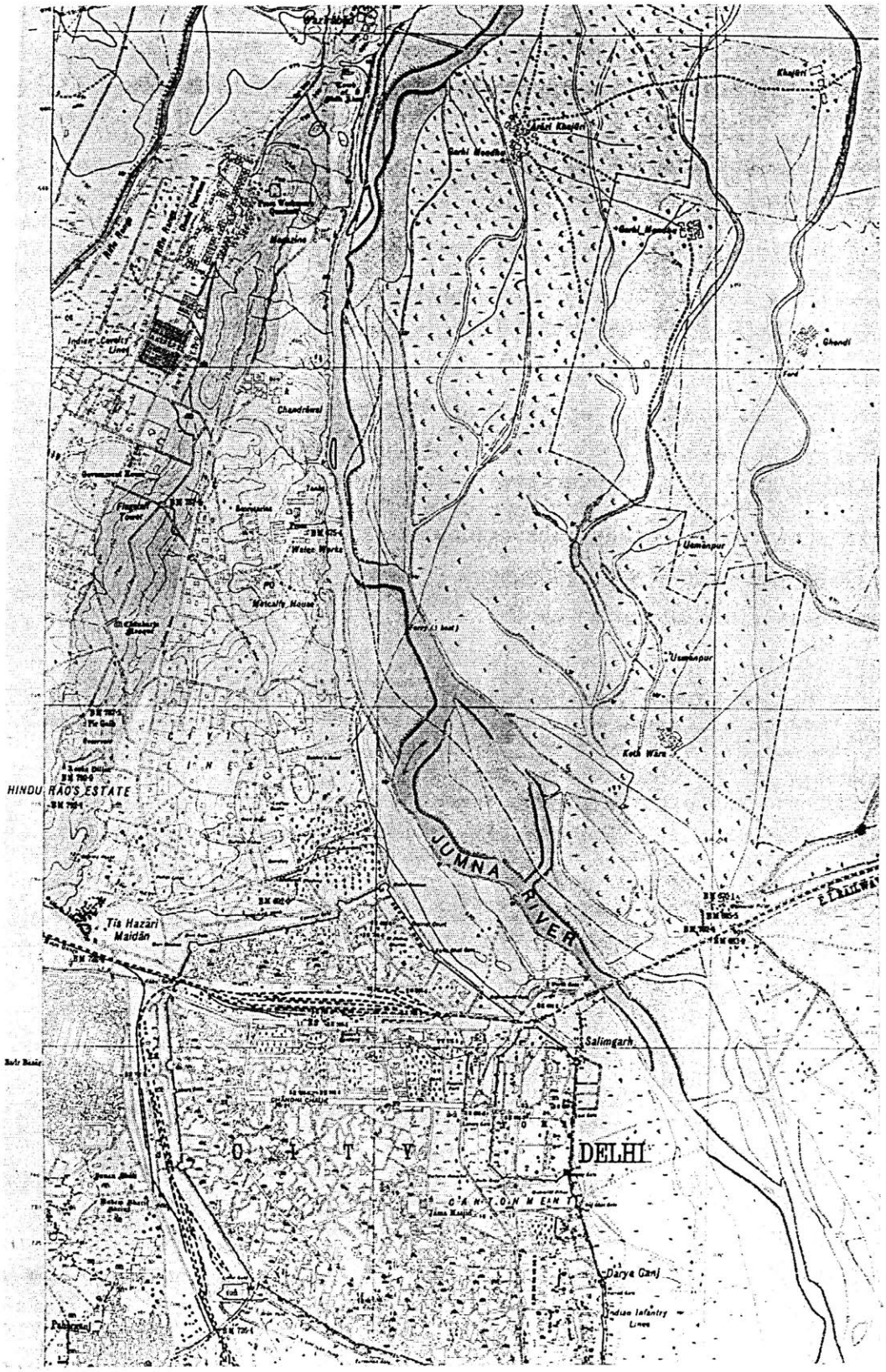


Figure 14. From Map of Delhi and Vicinity, 1912

Implications of this 'use factor' -- such as possible future directions of growth, agricultural potential of the surrounding areas, open space that is suitable for green belts, possible residential locations etc.,-- can now be read off the map through this newly invented system of textural symbols overlaid on surfaces and city elements.

Parts of the city are presented as potential resources to be exploited or the opposite on the basis of information that are graphically represented in maps such as those shown above. The instrumental nature of maps (with regard to planning for growth) is increasing and culminates in the commissioning of an extensive survey of the walled city by the Municipal Committee in 1910, which led to the production of the Wilson survey maps that eventually formed the basis of the new Master Plan in 1962.

The mainstream of thought that was moving along these lines of social urban development and gradual incremental growth, suddenly needed to slow down and take a back seat with the decision to build a new capital of the British Raj at Delhi. Political rather than social reasons were responsible for the form of the city in this period. Attention was wrenched away from a preoccupation with matters of expansion and development towards this new imperial exercise.

The New Capital: 1911 - 1931

In 1911, the British government decided to shift its administrative and political capital from Calcutta to Delhi. At a time when opponents of British rule in India were becoming increasingly active, the challenge to create a powerful symbol of colonial authority fueled the decision to build a great new imperial city for the purpose. The lure of Delhi with its historic association with past empires and emerging status as the most important and well-connected commercial center in Northern India was irresistible and recommended it as the ideal choice. All protests regarding the decision to shift, and doubts on the prudence of such a move were brushed aside, and in March 1912, the Delhi Town Planning Committee was set up to advise the government on the siting and layout of the new city.

By the end of May 1912, the Committee with Edwin Lutyens as member and chief architect, had agreed on a site south of Shahjahanabad. It was close to the existing city yet unencumbered by building and offered unlimited room for building and planning without any great constraint. Views towards numerous historic monuments encompassing the entire sweep of Delhi's history were seen as a potential that could be exploited. Raisina Hill, the highest point on the site from where one could see across to the old city was chosen by the Viceroy himself as the location for Government House (or Viceroy's Palace), and as early as June 1912, Lutyens had sketched out the rough lines for this building.[44]

The design of New Delhi

The governmental center on the Raisina acropolis as it came to be known, containing the Viceroy's Palace and the two secretariat buildings served as the crucial anchor for the central axis of the plan. From it originated Kingsway -- the most important ceremonial thoroughfare of the city. Designed to have water channels, wide lawns and rows of trees on either side, it looked more like a long linear park than a street. Facing this landscaped strip, and set back far enough to retain its expanse and

[44]Irving, *Indian Summer,* pp 55-90.

openness, were the administrative headquarters of various departments and public institutions such as museums and libraries. They extended the governmental and civic core of the city along the street and provided an imposing foreground to the nucleus on the hill. Subsequently, other institutions such as the National Stadium and Sports Club, the High Court, the Museum of Modern Art, and an international convention center were built around this strip adding to its envisioned civic grandeur and formal arrangement.

The second most important thoroughfare through the city was Queensway. Running perpendicular to Kingsway, it connected the elite areas of the city to the proposed railway station at Connaught Place -- the new retail and commercial center. Business and service related institutions such as the post office, hotels and offices lined this street, extending the commercial spine of the city southward from its nucleus at Connaught Place.

Creation of symbolic axes, extended views, and terminating vistas became the paradigm for the initial design. Streets were aligned on axis with important monuments, making symbolic gestures of association and linkage with significant monuments.[45] Strategically located nodes such as Connaught Place and historic structures from the past, were then adapted to become focal points around which the street pattern crystallized. To this day, these are the elements that contribute most distinctively to the image of the city.

Besides the institutional needs of government and commerce, the main requirement of the city was accommodation for its administrative officers and staff. While the identity of the core was built up through prominent institutional buildings and plazas, the residential requirement structured the visual character of the rest of the city. Single-storied bungalows set in spacious landscaped compounds were constructed within polygonal blocks formed by the geometrical street pattern. This New Delhi was a city of hexagonally radiating tree-lined avenues; of huge parks and traffic

[45]Irving, *Indian Summer,* p 79; Twenty years later in speaking of Lord Hardinge's founding role, Lutyens declared "His command that one avenue should lead to Purana Qila and another to the Jama Masjid, was the father of the equilateral and hexagonal plan."

roundabouts that were treated as parks; and of wide vehicular roads lined by dense shrubbery of the adjoining plots. New Delhi, accessed by wide formally laid out roads was for the most part, and still is, a very low density city.[46]

Given the strong official hierarchy of the city, the size of the residential compound, the area of the unit within it, and the distance from Government House were indicators of the importance of the prospective occupant. The largest bungalows housing the most important members of the colonial administration were located on thoroughfares nearest to the Central Vista. As one moved away from the center to areas of decreasing prestige, the size of individual compounds decreased as well. Furthest away from the center were the quarters of the indigenous and European lower-status assistants and clerks. In all, the residential sector of the city consisted of about 3000 single storey bungalows and quarters for its officers, clerks, and peons, establishing a clear pattern of social and racial segregation along the monumental avenues and lanes that structured its organization.[47]

The building of New Delhi can be seen as the third distinct phase of colonial development in Delhi. In many ways, its goals and objectives were similar to those of the second phase. The program of the new city while very different in scale, was not different in content. Administrative and military headquarters, residential accommodation for troops and officers, and social and recreational institutions -- such as libraries, museums, and clubs -- that had already been introduced by the colonial culture in the previous phase, remained the major requirements. Describing the relationship of the basic components of the new city, Anthony King says that the relationship of the new Civil Station of New Delhi, the new cantonment to its southwest[48], and the 'native' city to the north exactly replicated the pre-1911 colonial urban model in north Delhi.[49]

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[46]Irving, *Indian Summer;* Breese, *Urban and Regional Planning for the Delhi-New Delhi Area: Capital for Conquerers and Country,* pp 12-20.

[47]King, *Colonial ...,* p 248.

[48]King, *Colonial..;* Spread over 17 square miles southwest of New Delhi, the cantonment was laid out on a grid iron following the basic principles of earlier models. It comprised of the military headquarters, residences for military officers, separate accommodation for Indian and European troops, and traditional cantonment institutions.

[49]King, *Colonial...,* p 236.

Both cities perpetuated the formation of strongly segregated 'European' and 'native' areas, and this notion of dualism is the key to the explanation of the structure of both cities.[50] Social relationships between the rulers and the ruled, between the two cultural groups in the city, and between members within groups that were established in the nineteenth century were carried forth into this phase as well. The creation of this social hierarchy and its manifestation in the physical form of the city through preferential allocation of space and resources was a common theme.

The plan as a political symbol

Despite these similarities, however, New Delhi provokes a very different perception of its form, than the earlier colonial phase. The change in the content of and attitude towards representation of the city that can be observed at this time is related to this difference. It is relevant to try and establish the point where the conception of this city differs from the earlier one.

New Delhi was a planned city, not one characterized by incremental growth; the entire city was conceived as a single entity with each component placed in a related pattern of formal and social hierarchy. The central civic nucleus on Raisina Hill -- the symbol of the controlling authority of the city and the empire -- was the point of reference. The importance of every other component was determined with respect to its relationship to and distance from this point. Unlike the earlier city, this one did not borrow its locational attributes (such as use and prestige) from existing urban features. It created its own within the new pattern by referencing areas to another point within its internal structure. A sharp dichotomy between the two Delhis was created with the new city almost ignoring the old, except for cosmetic linkages such as visual axial connections.

The emphasis given to the creation of an overall image of the city resulted in a decline in the importance of the residential compound or unit as the form-

[50]Refer King, *Colonial Urban Development*

generating element, from the immediately preceding period. Areas were earmarked for residential development after the plan was formalized and subsequently filled in by bungalow units. According to the Final Report of the Committee, the disposition of various residences and institutions on the layout (based on Government of India calculations of area required for their personnel) had been the work of the Imperial Delhi Committee, whose task was to execute and administer the new city.[51]

Most importantly, the function of the new city as opposed to the old, was not only to accommodate but also to symbolize. The very nature of the city as a symbol of authority, established the priority (in terms of attention or emphasis) given to its elements. An image for the city was envisioned and translated in formal terms through devices such as imposing public settings, vistas, and a geometric street layout. The similarities with the old city - creation of an official aristocracy, segregated housing and social areas, and hierarchical planning - were continuing objectives that were superimposed on this vision. While integration with the existing city and other social concerns were voiced during the planning process, they were not allowed to supersede the formal and symbolic achievements of the design. Therefore, while Anthony King may conclude that the third colonial city was similar in organization to the second, its physical expression was markedly different. The following few pages show how evidence for this interpretation of the city is shown in maps and drawings.

[51] Irving, *Indian Summer,* p 76.

The Map as Political Intention

'Accompaniment to the Final Report of the Delhi Town Planning Committee on the Town Planning of the New Imperial Capital'

Dated 1912, this map shown in **figure 15** is the most representative example of the efforts of the Delhi Town Planning Committee. It shows the proposed street network for the new city and the location of major civic buildings. The focal point is Raisina Hill comprising the Viceroy's Palace, and the two Secretariats on either side of the Central Vista or King's Way. Running perpendicular to this boulevard is Queen's Way, terminating in a new railway station to the north, and an Anglican Cathedral in the south. At the junction of these two avenues, four large buildings are shown -- the Oriental Institute, National Museum, National Library, and Imperial Record Office -- forming a cultural or intellectual core along the Central Vista.[52] The rest of the city is organized around this central core. An internal relationship among these elements, emphasizing the geometric unity of the project is evident. This coherence is more strongly recognized than any relationship with existing elements along the periphery. As the representation suggests, the street network and the public buildings are the devices through which the proposed city is structured and understood.

In some ways, this plan reminds us of the sparse Persian map of Shahjahanabad (figure 4) which also describes the city through similar devices.[53] The representation of main roads, public and institutional buildings, and the formal, geometric relationship between them express the imperial intention that sponsored their creation, in both cases. The existence of other elements, though essential for the existence of the city are subsidiary to communicating the essence or image of the city. The difference between the two maps is that while the former is documentary, the latter is projective -- a plan. The difference also lies in the mapping

[52]Irving, *Indian Summer,* p 73.

[53]As Irving *(Indian Summer)* says "The passion for order and symmetry exhibited in the new Delhi's layout had an honorable ancestry in India: it was one of the Mughal's chief gifts to the subcontinent."

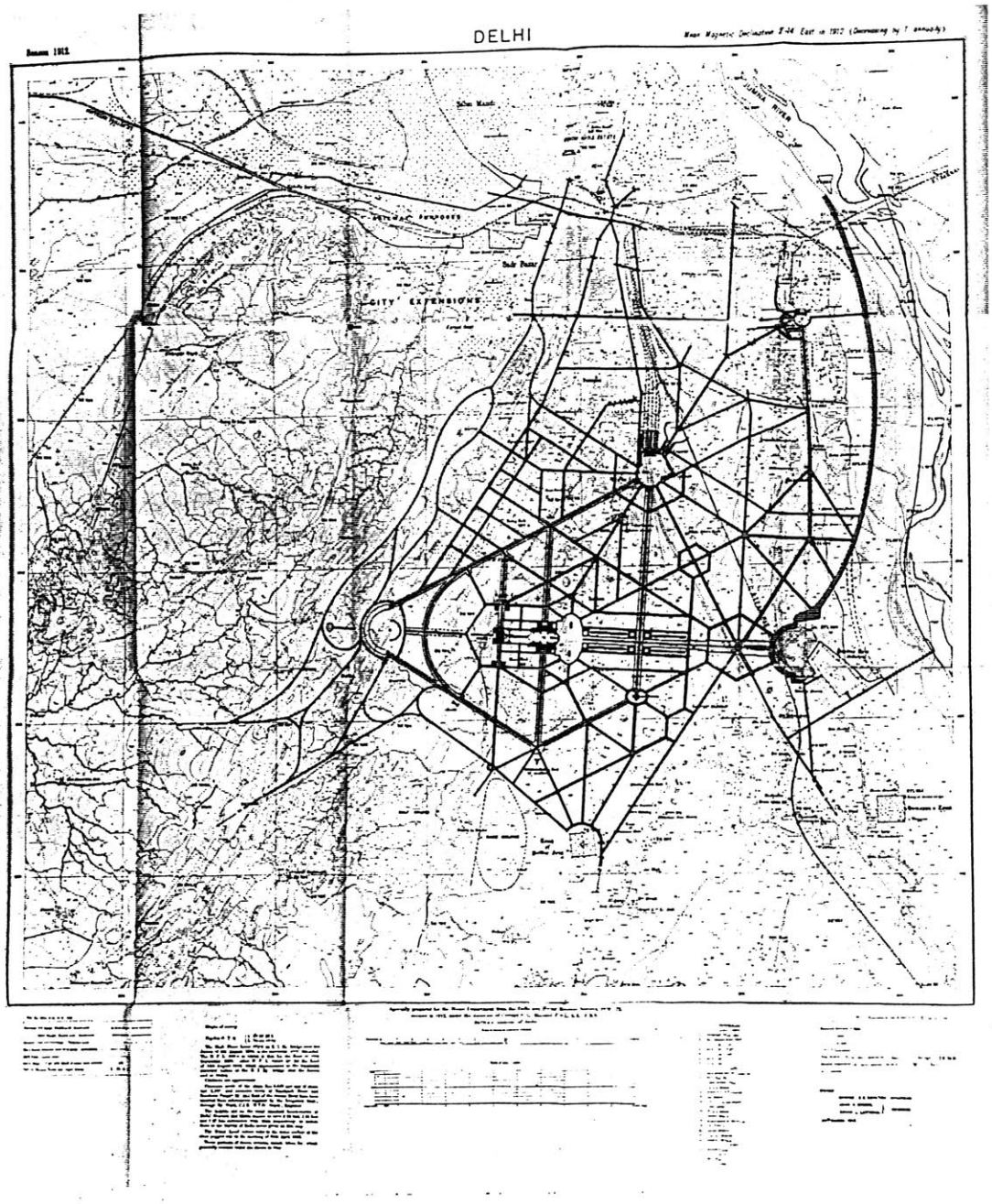

Figure 15. Accompaniment to the Final Report of the Delhi Town Planning Committee on the Town Planning of the New Imperial Capital, 1913

method used. While the earlier map does not exhibit an awareness of scale or dimensional accuracy, the latter is a product of an age when these attributes have been assimilated into the technique of cartography. In some ways this technique (which forces an awareness of the physical context or setting in terms of geographical structure and location) modifies the otherwise almost topological ideas reflected by this drawing.[54]

It is interesting that this map does not contain any buildings other than the main public ones. There is no indication of a residential fabric or even an area marked as such. The issue that the map implicitly establishes through these omissions is the diminished importance of individual structures (particularly residential) relative to the overall design. While the typical bungalow type development continued to be used to house the residents of the new city, it was done so as infill in predetermined polygonal blocks; the residential unit that achieved such representational prominence in the preceding phase (as seen in the map of the Bangalore cantonment, figure vi) became subordinate to and not generative of the urban quality of the new city.

While the program or functional objective of the new city was more or less a continuation from the earlier phase, the symbolic function and anticipated image of the new city was unique to it. This image had to be ensured before the program was fitted in. A comparison with 'Plan of the British Position at Delhi' (figure 12) drawn at the onset of the previous phase of the city in 1857, emphasizes the difference in their process of evolution. While the former shows the texture of incremental development as it was taking place (where the planned organization of residential and administrative areas was based on the knowledge of existing areas and their hierarchies) the latter is presented as a self contained entity and expresses an aesthetic consistency

[54]The geographical 'structure' of the map allows the user to see in it possibilities of integration with the old city through devices such as axial physical linkages and visual connections. A 'symbolic' axis through the new Parliament building, Jama Masjid, and the Fort in Lutyens' final plan for New Delhi or other considered connections such as one between the Viceroy's palace and Purana Qila are gestures that are clearer on a map than on the ground. Represented through a street that runs along this imaginary axis, a perceived synthesis with the old city is achieved which may not have any real social significance. By addressing the question of integration and demonstrating it through such symbolic devices, the serious component of the debate gets pushed to the background.

and social hierarchy internal to it which does not include or depend upon the surroundings.

The New Delhi enterprise does not appear to be an additive exercise as the earlier one was. It has been discussed in the previous section that New Delhi was a superimposition of an idea on the ground, the organizing principle of which was the provision of grand views and vistas, and imposing settings for public buildings. The devices used to achieve this were the roads, main buildings and their architecture, and the landscape. Accommodation of different functions and social groups was a subsequent operation. The essential difference in conception and perception of the two cities that is apparent in their representation is best expressed in Anthony King's words:

> "The Civil Station had grown gradually, by accident, over the years. Relatively haphazard and unarranged, it was an informal provision for a community, expressed in a cultural way. New Delhi however, was very different. The measured grid was evidence of three levels of colonial control. It expressed total control over the environment, with the power to define boundaries and order the spaces within them; it represented total control over the social structure, the power to order precedence, create communities, and control social relations between them. Third, it expressed total control over the process of allocation; once the places were created they would be filled according to plan."[55]

'Layout Plan of New Delhi'

This map, shown in **figure 16**, was released in 1931 by the Survey of India to coincide with the inauguration of the new capital. It is a guide map of the new city that accompanied the effort of the colonial power to present the showpiece that had been created for the British Raj. Despite tentative attempts to forge a link with the old city, the new capital was perceived of and ended up as an autonomous unit having its own distinct character and identity. It was conceived of as a diagram of the imperial vision and concretized the idea of empire, social hierarchy and segregation in its formal structure.

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[55] King, *Colonial...*, p 264.

Figure 16. Layout Plan of New Delhi

The nature of the new city that is represented in the initial New Delhi plan (figure 15) can be better understood if it is known to have been preceded by an exercise such as the one shown in **figure viii** (see page 80). Titled 'Imperial Delhi, Index Plan of Layout' and drawn in 1927-28, this was Edwin Lutyens' final plan for New Delhi. It is not a map but an architectural drawing of the city.

The ability to conceive of a city in a drawing and then overlay it on a site came with an understanding of the concept of scale and the structuring of landscape on a Cartesian grid. This new concept of overlays made it possible to look at different aspects of the city in layers. Land form could be seen in one drawing; the design of the city could be worked out on another. Subsequently one could be superimposed on another and either one modified to achieve a desired relationship. While the Cartesian technique that facilitated this had characterized mapping and drawing operations for over a century, its full potential was explored only at this time. The street plan represented one such layer of the future city that was worked out separate from the context. The internal consistency of the final product suggests that very few pieces of contextual information was used in structuring the internal layout of the city. The existing physical surroundings were addressed only to the extent of setting certain physical limits for the city. In fact, the initial choice of site itself was largely dictated by the requirement of an area of unfeatured terrain perceived as necessary for the new capital.[56]

As seen in an initial sketch shown in **figure ix** (see page 81), plazas and streets woven around a civic core were used to arrive at the basic form of the city. It was therefore, incumbent on these elements to create the place; to be the medium through which the formal objectives of the enterprise could be achieved. The design had an aesthetic consistency, and a formal hierarchy that played out within its confines. Geometrical organization was used to maximize the experience of grandeur and awe. The form and distribution of infill elements -- green open spaces, residences, and

[56]King, *Colonial...*, p 267; Irving, *Indian Summer*, p 55.

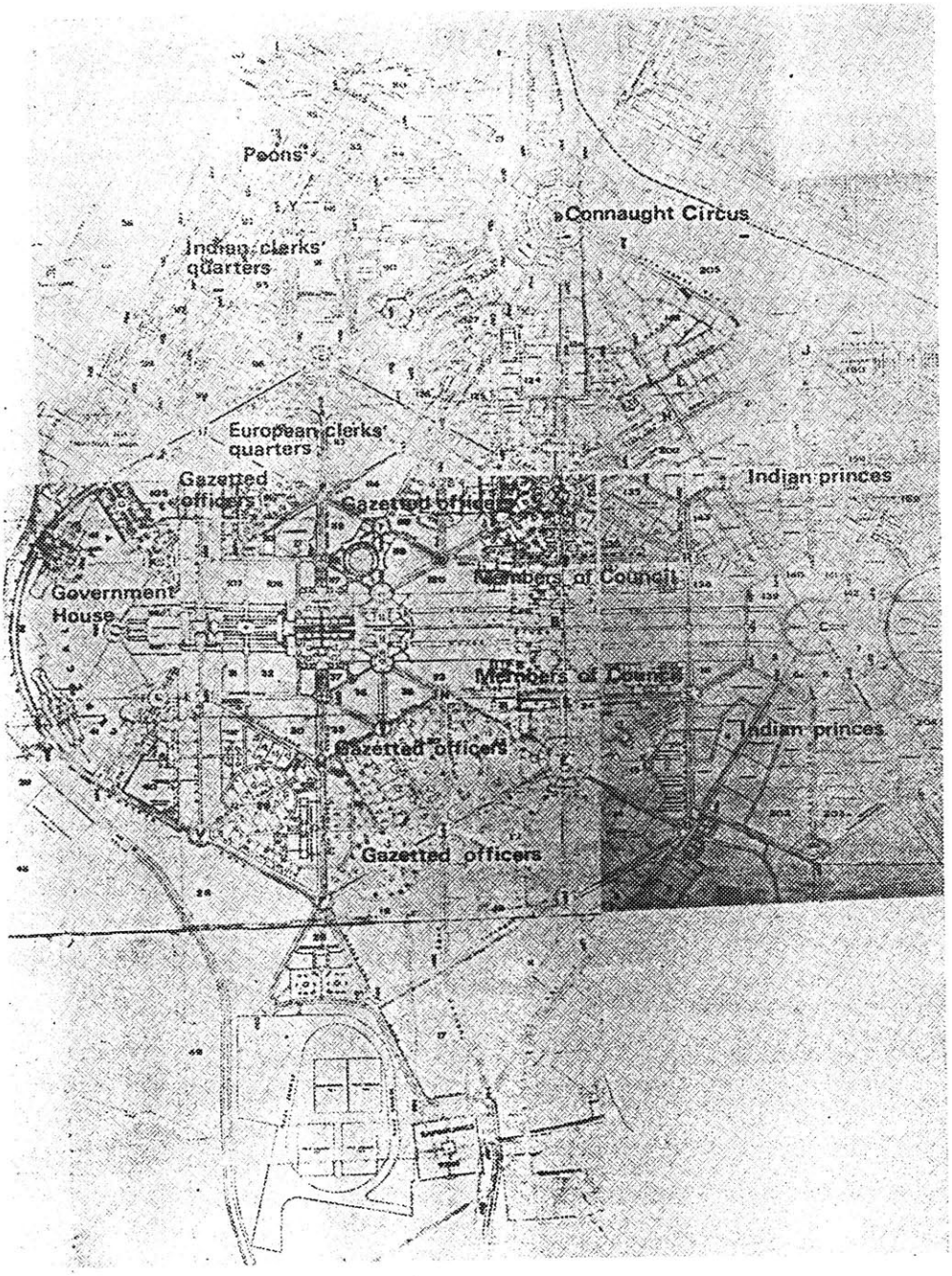

Figure viii. Imperial Delhi, Index Plan of Layout

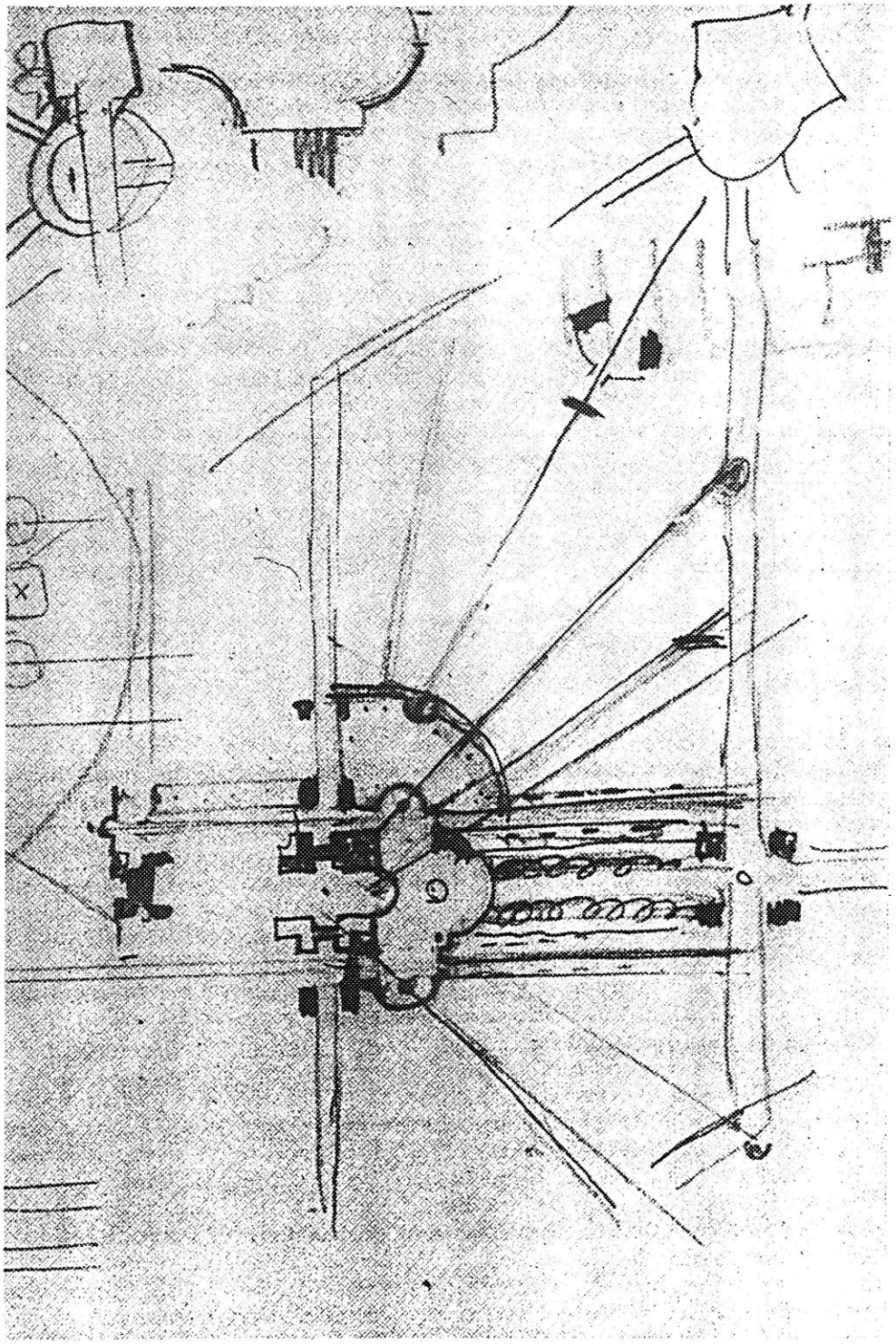

Figure ix. Edwin Lutyens' Sketch Plan of Viceroy's House and Adjacent Areas, 1912

secondary institutions became a second layer of information that was overlaid on the first.

Once it was determined, the framework was used as an underlay for the spatial distribution of a highly stratified society. Within the hexagonal grids, areas were allocated on the basis of race, official rank, and social status. As can be seen, separate areas for 'gazetted officers', 'European clerks', 'Indian clerks', and 'Indian princes' were set aside around the governmental core. In each of these sectors, accommodation of varying sizes were allocated according to rank. The status of the accommodations could be communicated by several indicators - elevation, distance form Government House, size of compound, size of dwelling, width of road, name of area, and even name of road.[57] In this way, an abstract notion of social hierarchy that existed in the mind was literally etched into the forms on the ground. The diagrammatic formalization of the social structure of the city in physical spatial terms that resulted, distinguished this phase of development from the earlier one (which displayed an informal spatial segregation on the basis of race and class).[58]

There is little doubt that 'Layout Plan of New Delhi' is a clear representation of the intent of the designers. The information contained is very selective and the frame of view carefully constructed. It concentrates only on the new city and omits to show the walled city and other existing areas; parts of it do appear at the corners of the map but are rendered peripheral to the new city. Integration with the old city had been an important consideration, emphasized by some people, but separation and exclusivity of the new capital was sought and eventually achieved.[59] Not showing the existing Delhi and focusing only on the new part, represented an effort to sideline

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[57]King, *Colonial...*, p 246.

[58]King, *Colonial...*, pp 223-228; The Coronation Durbars (which were ceremonial gatherings of Indian Kings and the colonial power in an attempt to evoke the royal durbar tradition of the Mughals), established the social hierarchy of space in their temporary layouts. Held in Delhi in 1877, 1903, and 1911, they provided a model for the organization of space in the plan of New Delhi.

[59]Irving, *Indian Summer,* pp 57-58; Henry Lanchester's plan for New Delhi, based on Patrick Geddes' philosophy of corrective surgery on existing fabric, rather than wholesale redevelopment which insisted that "every necessary improvement should maintain the general character of the city" was ultimately superceded by Lutyens' Beaux Art design for a new city.

the contemporary debate that centered around the comparison between the two cities.

Within the frame of view that is chosen, a selectivity and differentiation of content starts becoming visible. Public buildings are shown in a darker shade of the same color that is used for the residences. These are focal points in the city. Some of these focal buildings are historical monuments which Lutyens found useful "...only to terminate the main axes of Imperial Delhi and to provide strong visual accents emphasizing the streets pattern, in the fashion of contemporary Beaux Arts or City Beautiful planners."[60] Existing monuments and past structures to which some initial importance was imputed by Lutyens thus find a place in the new city pattern and map; others, even if they are not eliminated are not shown. The map establishes the irrelevance of such existing structures that are not central or complementary to the new scheme. By obliterating them and earmarking others as points of importance in the representation, the map succeeds in assigning different degrees of attention to them in the decision making process. It has been seen that many monuments and urban landmarks fell to disrepair and neglect as they did not form part of the scheme that was currently being pursued; their existence went unrecorded and as a consequence they ceased to be important features in the urban scape of Delhi. The new city dominates and edges out concerns that do not deal with it. In terms of image, and attention the new city occupies the central position, and all future maps that are produced of the city show New Delhi and its governmental core at the center of the representation.

[60]Irving, *Indian Summer,* p 80.

From Map to Plan: Documentation to Projection

Maps of the city made after the introduction of British colonial rule in Delhi in 1803 were characterized by a radical change in cartographic technique from the previous period. The 'Sketch of the Environs' (figure 5), made in that year, was one of the first maps of the city to be drawn in this new method and inaugurated the adoption of a Cartesian coordinate plane for representation. Borrowed from European tradition and introduced into the country by the colonial authority, this move had a profound impact on the form and representative abilities of subsequent maps and vastly extended their role in reflecting new values and documenting new developments in the city.

The underlying framework that the Cartesian structure brought to the depiction had enormous implications on the perception and representation of cities. For the first time, different elements of the city could be envisaged and illustrated with a better understanding of their relative positioning in overall Euclidean terms. Each part had its specific location in a now more clearly represented whole. Suddenly, maps had the ability to represent and convey a more structured web of relationships, as opposed to the topological contiguity-based linkages that the earlier ones could.

A simultaneous development was the elevation of the viewpoint to a position well above the land. The ability to view the city from a hovering vantage point helped the emergence of an overall picture where the relationship of parts to a whole could be clearly perceived. The development of the bird's eye view -- not a formal map making technique, but a pictorial depiction -- was a concurrent response to the emerging perception of the city as a single entity composed of aggregate parts. Not only could parts of the city be seen in terms of true geographic relationships but, for the first time, cities could be seen as components of the wider regional landscape (as in the 'Sketch of Environs'). The sweeping view of the city that the elevated viewpoint permitted expanded the role of mapping for purposes of reconnaissance and familiarization. For an authority that

had territorial hegemony as a dominant objective, such a perspective of the city and surroundings encouraged a sense of control and power over it.

An emerging sensitivity to landscape and existing built form, and the perception while in one part the city, of being in a network of relationships with surrounding parts became apparent. Whether it was the siting of initial bungalows and military accommodation in close proximity to the palace-fortress in the early 1800's, the choice of an alternate location outside the city for the new Cantonment and Civil Station in 1828, or the choice of a new site for the new capital in 1911, the awareness of the surroundings as potential resources or liabilities was evident. Such a perception of the city, where parts were in relationship with each other and additions would constantly reference existing areas was reflected in maps of the time in several ways; detailed rendering of the old city in 'Shahjahanabad' (figure 6), and a detailed survey of the landscape in the vicinity of Delhi, were examples of selected information that informed these decisions.

Scale and dimensional accuracy -- the basis of the new technique -- became critical attributes of the representation. Elements so far shown iconically through a set of visually exaggerated symbols started being represented in a consistent manner. Chandni Chowk in 'Map of Dehly' (figure 2) is disproportionately wide -- signifying the perceived importance of the street -- when compared to its surveyed version in 'Shahjahanabad' (figure 6). The new technique (of the latter plan), precluded such symbolization and hierarchies could not be portrayed through such subjective devices.

The introduction of the Cartesian underlay, and the consequent emphasis on scale, proportion, topographic accuracy, and consistent symbolization introduced the concept of objectivity. The new rule-based method instituted a rigor into map making replacing the flexibility of the earlier pictorial tradition with scientific principles. The Great Survey enterprise and the attitude towards accumulated topographic information of the city -- as an essential input into decisions regarding development and administration -- helped orient the new abilities of cartography towards documentation. Maps such as 'Map of Delhi and Vicinity' (figures 13 and 14) illustrated a

'true' recording phase as opposed to an interpretive, explicitly symbolic one, revolutionizing cartography and creating a new role for maps as a graphic inventory of 'useful' information.

Though not explicitly stated, maps were now in a position to become tools of government. Maps such as the cadaster could not only assist in effective revenue generation but also in effective administration. Parts of the city were now presented as 'potential resources' or its opposite, be it land, streets. or physical features, and could be seen as points of reference giving value to their surroundings.

Cartographic characteristics and the potentialities of representation remained constant through the three stages of colonial rule. Even so, this is one period where a variation in map content and presentation can be clearly seen as the attitude of the ruling power towards the existing city and towards their position in it fluctuated from one period to the next.

In the early part of colonial rule, a perceived need for association with indigenous elite areas dominated decisions to locate; as the British became more secure in their position of authority, the desire to move to a more conducive environment away from the congested 'native' city led to the creation of racially segregated areas, and social contact between the two cultures diminished; and finally, with the decision to build a new capital city in Delhi, any attention that may have focused on the old city withered away. Each situation created a different kind of impetus for growth with different areas being privileged over others. 'Shahjahanabad' (figures 6, 7, and 8), showing a detailed rendering of the built form of the walled city, particularly the mansions and gardens of the elite areas, and 'Layout Plan of New Delhi' (figure 16) showing the layout and infill of New Delhi, at one level show the morphology of two different parts of the city. A deeper reading however, points out the neglect of the walled city in the second representation, which is a significant piece of information regarding its status in the general perception of the city. Similarly, a lack of detail within the walled city in its representation in 'Map of Delhi and Vicinity' (figure 13

and 14) when plot boundaries are shown in the adjoining British quarter indicates which area commanded more attention in the city.

One common feature in most maps of this period was the appearance of a fine grained texture. The depiction of micro elements such as residences and institutional buildings not only showed the form of development at that scale but also suggested the emerging status of the residential module (an individual building on a plot) as a generative component of city form.

Changing political circumstances, new social conditions and variables such as the introduction of technology, the emerging mood for social improvements, and the emphasis on health contributed towards fashioning the set of values that underlay the dominant perception about the city in different periods. It was these set of values that governed ideas about an ideal or desired city form and motivated action that led to development and expansion. It was these ideas that caused an emphasis in representation on one area or one aspect of the city over another, so that maps captured more than the physical condition of the city; in their choice of content and presentation they were products of a state of mind about the city that prevailed at the time.

Each map tells a story about the city at the time the map was conceived. Each map is a response to a specific sociopolitical condition that structures the information within the larger structure imposed by the cartographic technique. It is also at this level that we are able to discern the sensitivity of maps and map content to social and political fluctuations in the city and study the interaction of representation with the current idea of city form.

Following the upheavals brought about by independence in 1947, the urban situation in Delhi went from bad to worse. Enormous population increase, uncontrolled growth, and uncoordinated city policies resulted in a frantic search for means to govern and regulate . The next chapter looks at the emergence of maps as a response to this need, and as symbols of the new perception of cities as a system of functions.

Chapter 3

MAPS AS ANALYTICAL TOOLS FOR CENTRAL PLANNING

Population Explosion and Urban Expansion: 1947 -

The partition of India in 1947 had more immediate consequences on the growth of Delhi than any other event following Independence. Millions crossed the borders between Pakistan and India and there was a massive influx of refugees into the Delhi area. It is estimated that the population of the city increased by nearly 500,000 within a single year.[61] Temporary camps with rows of tents to accommodate the influx mushroomed all over the city, giving rise to a potentially explosive social and urban problem.

The resettlement of these victims of Partition was taken up on a war footing by the new government of independent India. New townships in the urban fringe of Delhi at Kalkaji, Tihar, and Sheikh Sarai were planned in 1948 by the Improvement Trust for the Ministry of Relief. In 1949, a Central Coordination Committee for the Development of Greater Delhi was established as part of the Central Public Works Department; through intense efforts of adjustment and improvisation it set up 36 permanent rehabilitation colonies in different parts of the city. This national emergency was met with immediate action but most of the areas had very meager resource provision and a deficient development that involved severe compromises on standards and living conditions.[62]

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[61] Breese, *Urban and Regional Planning ...*, p 20.
[62] Jain, *The Making...*, p 75.

The increase in population resulted in a phenomenal demand not only for housing, but for services, commercial and retail areas, office space, and other institutions such as schools and hospitals. While the government was trying to come to grips with the situation, private developers started construction and transactions in land without any development plan, provision of amenities, rules or controls. The city started growing outwards at a tremendous pace without a corresponding extension of transportation or services. In less than a decade following Independence, the urban boundaries of the Delhi that the new government had inherited was vastly extended.

Ten years after Independence the walled city with 10 percent of the built up area of Greater Delhi had 60 percent of its total population; New Delhi with 28 percent of the area had 17 percent. There was an extraordinary difference in population density in different parts of the city. In Old Delhi gross densities were 106,197 persons per square mile; in New Delhi it was 9472 persons and in the Cantonment, it was just 1909. There was also a vast difference in terms of access to resources and infrastructure, lifestyles, incomes, and opportunities.[63]

In the absence of any coordinated approach to urban growth there was neither any effort to alleviate the extreme congestion of areas such as the walled city, nor any move to contain the haphazard urban growth at the fringe. The city was run by multiple agencies which by this time included the Delhi Improvement Trust, the Delhi Municipal Committee, the Notified Area Committee, the Land Development Office and the recently established Central Coordination Committee. Each agency worked within its own sphere of jurisdiction with little effort towards understanding the functioning of the city as a whole.

The rise of modern master planning

Responding to this chaos, the Government of India set up, in 1950, the Delhi Improvement Trust Enquiry Committee. While its main role was to

[63] King, *Colonial...*, p 274.

evaluate the work of the Delhi Improvement Trust that had been set up in 1937 to cope with the needs noted by an earlier report on the city, it was also asked to make general recommendations to deal with the deteriorating urban situation. It said:

> "The achievements of the Trust during the thirteen years of its existence are not at all impressive....it has undertaken neither a Civic Survey nor a Master Plan with the result that the growth of Delhi has been proceeding in a haphazard way, with little foresight and imagination and without any coordination."[64]

The report made suggestions for control of both government and private development schemes, and suggested a central authority -- in place of the many overlapping ones -- to make planning schemes and administer them with adequate powers. In 1955, the Delhi Development (Provisional) Authority was constituted that recommended the preparation of a Master Plan for the city. In December of the same year, the Town Planning Organization was established as an advisory body to the D.D.(P.)A.

The Enquiry Committee was the first forum to recognize the inadequate supply and inequitable distribution of social and economic amenities as urban problems that needed to be redressed through planning. It recognized the need for a better understanding of the processes within the city and a better control over them. The city began to be thought of more in terms of the functions and performance, rather than its physical form. It was perceived, studied and represented as a collection of overlapping systems; urban form began to connote more than physical form -- it encompassed economic, social, and population characteristics as well.

In 1956, an Interim General Plan for Greater Delhi was made as a prelude to the preparation of a comprehensive master plan. The Plan consisted of a report, 19 study panels, charts and tables, and a proposal plan. The study panels presented information on land classification, historical growth, existing landuse, residential areas, commercial areas, institutions, open spaces, circulation patterns, and population trends. The separation of city

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[64]Breese, G., *Urban and Regional Planning ...*, pp 20-21.

information into layers was an eloquent representation of the rational understanding of the city that characterized this period.[65]

It also indicated a modification in the approach towards representing the city, especially in the context of planning proposals that would be made in the future. As some of the maps made for subsequent Master Plans show, the cartographic method adapted and responded to the challenge of presenting new information while expressing and reinforcing the analytical understanding of the city.

[65]Breese, G., *Urban and Regional Planning ...*, p 26; A team of professional planners sponsored by the Ford Foundation acted as consultants to the Government of India for the preparation of the Interim General Plan. They inducted into the process the resource management approach to deal with urban problems and the new understanding of the city as functional system.

The Map: Management of Facts and Figures

Existing and Proposes Landuse Plan: Delhi Master Plan, 1962

The existing landuse plan shown in **figure 17** (see page 94) is a map from the First Master Plan of Delhi published in 1962. The most striking aspect about it is the non representation of built form or landscape. The river, streets, and railway lines are the only topographic elements that are delineated. No building is outlined, not even important public structures such as the Government House, the Secretariats, or the Parliament. However, the entire area is broken down into parcels which are color coded to show their dominant use. Separate colors are used to differentiate between governmental, commercial, industrial, residential, agricultural, and recreational use of land. A differentiation is also made between residential areas of different density and between specific types of commercial, industrial, or recreational use.

This map represents the emergence of existing and potential use as an additional attribute of the land and adds a new dimension to the perception of the city. The awareness of this attribute as contributing to an understanding of the city was seen as early as in the early twentieth century. In the 'Map of Delhi and Vicinity' (figure 13), we see the beginnings of an overlaid symbolization on unfeatured landscape that delineates its character as barren, agricultural or under rural habitation and in 'Layout Plan of New Delhi' (figure 16), institutional and government buildings are shown in a shade darker than others to differentiate between important public and private use.

However, the plan in figure 17 is perhaps the earliest published example of a map that breaks down the entire city in terms of its landuse. It permits the user to ascertain the program of the city; to calculate the areas given over to particular functions; and to understand the distribution of these functions (or resources) within the city. The nature of the map in **figure 18** (see page 95), which is the proposed landuse plan for the city, makes it evident that planning decisions for the city also took the form of allocating and distributing land for specific uses. By containing such information that can

Figure 17. Urban Delhi: Existing Landuse, 1962

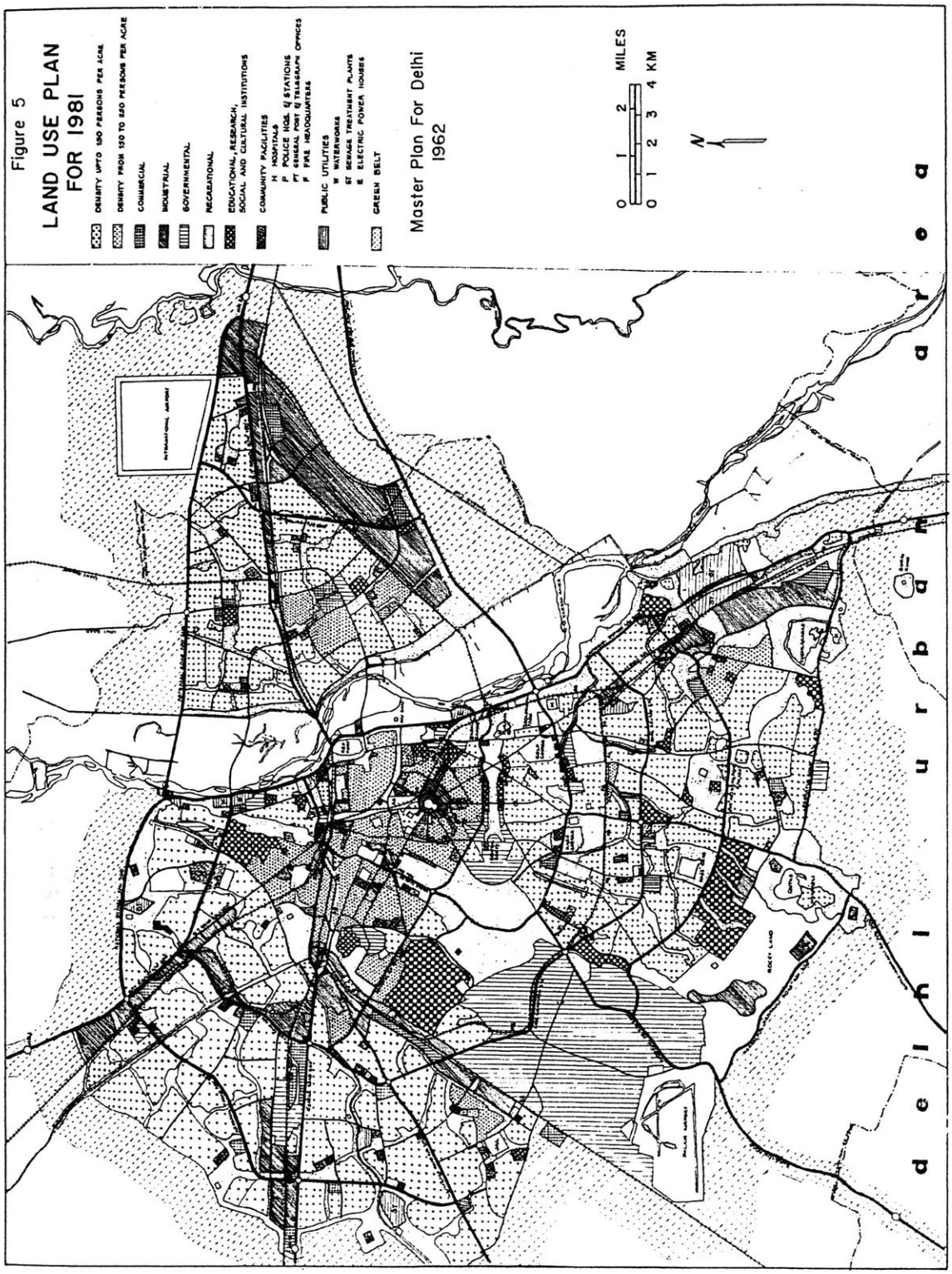

Figure 18. Landuse Plan for 1981 : Master Plan for Delhi, 1962

be a direct input into development and planning decisions, the existing landuse plan is an early example of a map drawn for purposes that are directly instrumental to the production of a design and planning proposal for the city.

Making landuse the parameter to record and propose physical changes to the city represents the shift in perception of land from a topographic feature to a resource (of some potential use). A comparison between the New Delhi proposal of 1912 (figure 15) and the proposed landuse plan of 1962 (figure 18), brings out this shift in perception of the city from an entity composed of physical elements to one composed of social and economic events and activities. The New Delhi proposal is a physical diagram of roads, open spaces, public buildings and predetermined residential types in a designed configuration. In the proposed landuse map, planning for the city is no longer seen as an exercise in the construction of parks, roads, and buildings. The principles to reorganize the physical structure of the city are now derived from statistical information relating to the social and economic activity within the city. Spatially anchored categories of information relating to population density, intensity and type of commercial use, and location and extent of industry, expressed through 'landuse' become the new means of perceiving the city.

It is implicit that the landuse map shown in figure 17 has been preceded by statistical surveys and census data regarding the distribution of population, resources and commercial and social activity within the city. The process of accumulation of such knowledge had started in the nineteenth century by the British; however, it was not until 1956 when preliminary studies for the preparation of the Interim General Report were made, that maps became directly concerned with social and economic occurrences in the city. The need to plan for the city at this time arose primarily from a general dissatisfaction with the inequitable distribution of resources and living conditions and an inadequate supply of social and economic amenities. As written records and studies of the city at the time suggest, changes to it and location of new planned facilities were motivated more by such information rather than purely physical considerations. Decisions on city growth and

development were taken and evaluated on the basis of the effect they would have on the socio-economic performance of the city. Maps of the city showing residential density, industry, traffic volume and accident occurrences, water supply and sewage distribution, income distribution, open spaces, 'urbanizable' areas, were made establishing them as the new components of the city.

The change in the nature and content of maps in the two examples above -- from showing landscape features and built form to showing the spatial distribution of socio-economic attributes -- reflects new priorities and agendas for city building. The perception of physical form as the critical defining element of the city is broken down and supplanted by concerns of equity and efficient resource management.

Transportation and Utility Plan, Delhi Master Plan 1990.

These are representations of the city taken from the Master Plan for Delhi, published in August 1990. The configuration of the roads is borrowed from a surveyed topographic map and their geometry is accurate and in proportion to their actual dimension. This preserves the geographical structure of the city despite it being a very diagrammatic representation. On this structure is overlaid information of a specific kind that can now be viewed not only in terms of its location but also in terms of its spatial distribution.

Figure 19 (see page 98) shows the existing and proposed transportation network in the city. There is no feature of the city shown other than its roads, railways and associated functions such as airports, railway stations, and major bus stations. Roads that have been categorized based on load bearing capacity (which is the classification used for planning purposes) are symbolized differently, so that all highways are shown similarly, all arterial roads have the same symbol, and so do all cycle tracks. It is not a true denotation but an abstract symbolization which is neutral and objective in the specific map context only; the same roads cannot be differentiated by size, width, importance, or intensity of use at the same time.

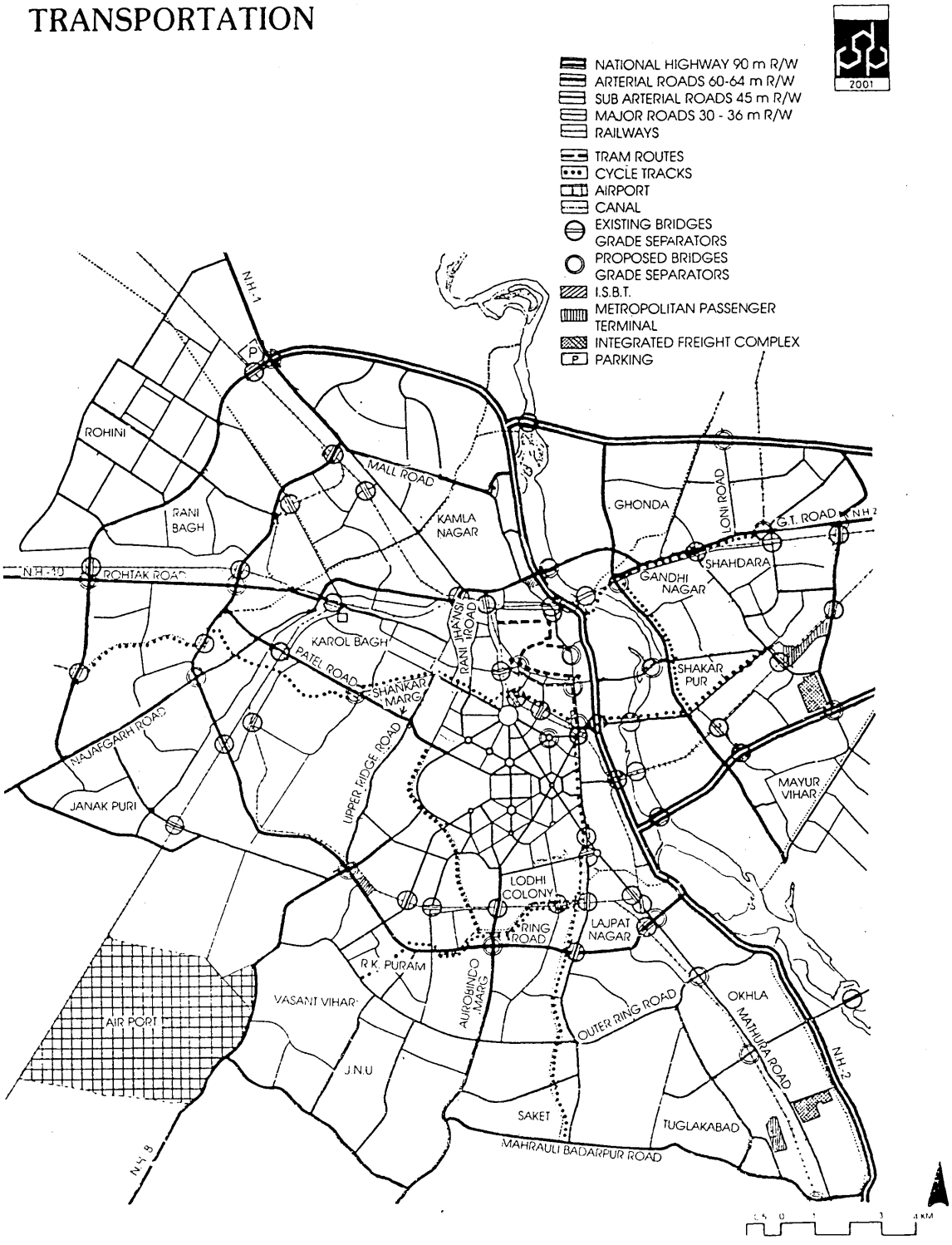

Figure 19. Transportation Plan, 1990 : Master Plan for Delhi, Perspective 2001

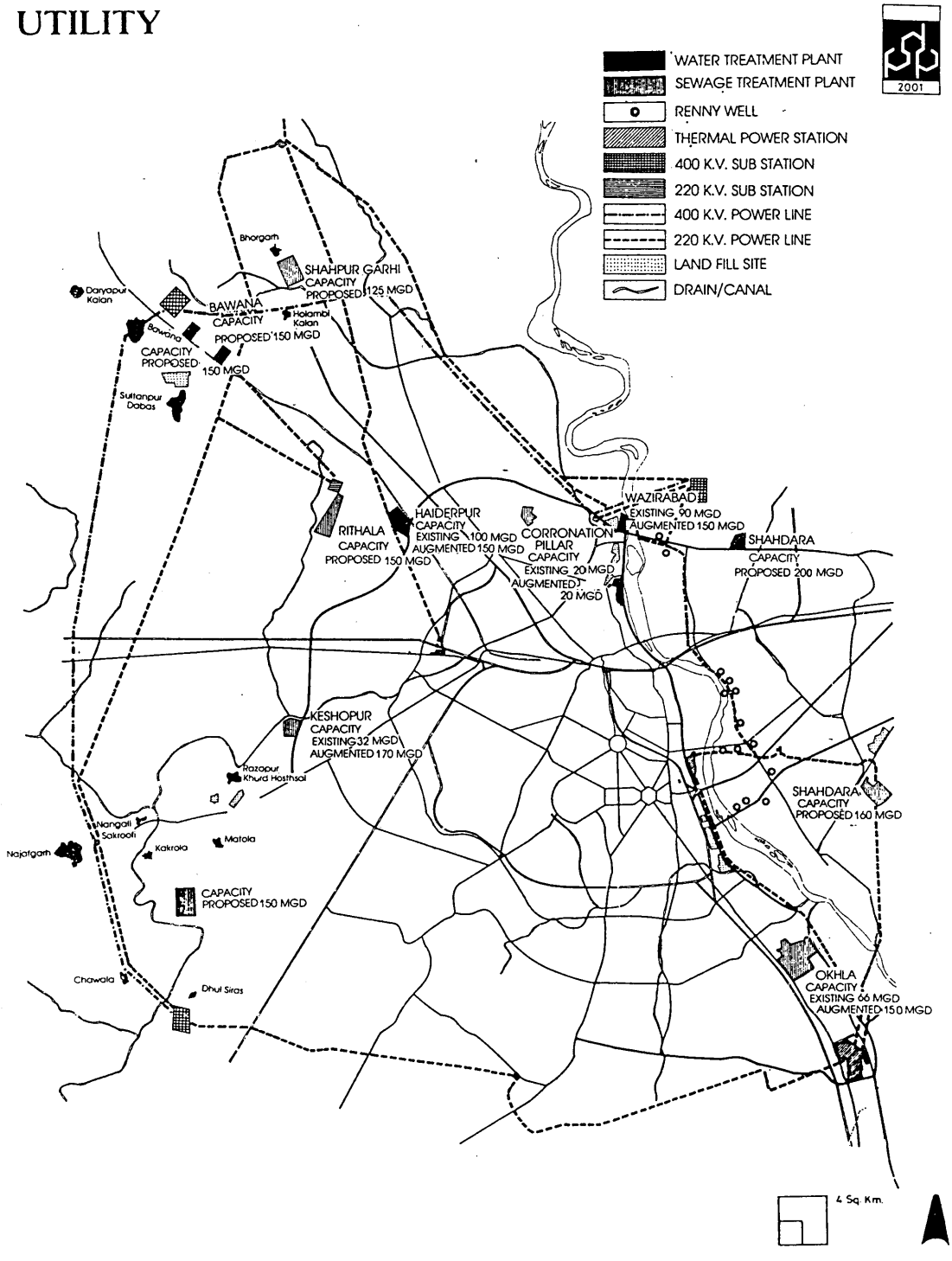

Figure 20. Utility Plan, 1990 : MasterPlan for Delhi, Perspective 2001

This map is made to convey only a specific type of information, in this case about the location of transport infrastructure by type.

Figure 20 (see page 99) is a similar map that shows the utility and service network in the city. As in the earlier diagram, different symbols are used to mark the location of service facilities such as the water treatment plant, thermal power stations, electric substations, and landfill sites. A few roads are also shown to establish the structure of the city and to act as a framework to which the location of these different sites may be related.

Distributed as it is on an underlying geographical structure, such information not only gives an idea about the existence of these facilities but also their location, the points they connect, the points they pass through (this in the case of the transport map), and the relative distance of any point in the city from any of them. It is a plan that permits an analysis through extrapolation about the potential proximity of these resources to different areas of the city to determine the need and possible location of future facilities.

Both maps have two very distinctive characteristics. One, they are single-idea or thematic maps that provide specific knowledge about one aspect of the city. Two, they provide this information on a city diagram that has a geographic structure to it. This allows the user to extrapolate information and make inferences about the potential impact of the shown features on different areas in the city. Thematic maps of this kind start being produced when the quantity of information about the city (particularly that which has a social and economic impact) increases and its analysis becomes relevant in developmental and administrative decisions. The city begins to be understood as an aggregate of interacting systems each of which can be looked at independently. The representation of it then responds to this new perception by accommodating each system or category of information in one layer. It is not hard to see the analytic power of these maps and recognize their instrumentality in helping to arrive at informed proposals for the city.

Such maps represent an innovative interaction between the extensive reserves of accumulated socio-economic and physical information about the city and selection of map content. Together with the adaptation of new ways of abstract symbolization, this results in vastly expanding the analytic capabilities of cartography and its potential use in being a direct aid to planning city growth.

Organizing the City as System

The two pairs of maps that have been discussed above illustrate the two major features that characterized new developments in map making after 1947. The first was the emergence of abstract information overlays on the city structure. Socio-economic data was depicted in these maps as opposed to only building profiles and landscape elements of the topographic tradition. While such maps did not altogether replace topographic maps, which continued to be made and used, they did supersede them as the dominant background information required for designing growth.

The shift from showing morphological data in the early part of the nineteenth century to showing the geographic distribution of population attributes and other socio-economic activity in the twentieth, represented the growing role of the latter as opposed to the former in making important decisions about growth and development. Josef Konvitz's observation regarding the development of thematic cartography in France, a century earlier, as a response to such a shift in perception about relevant information about the city is valid even in the context of Delhi. He says referring to a specific instance:

> "In the late eighteenth century, topographical configurations such as watersheds figured prominently in the concepts of map-related studies of transportation routes, but heavier than expected rates of urban growth, rising construction costs, and competition between sponsors of major public works projects brought about a change in the views of some engineers. The realization grew that investment in public works should be determined by existing and probable concentrations of people and business rather than by purely topographical

considerations, since only then could the investment be successfully amortized."[66]

While economic considerations may not have been the sole determinant of the location of planned resources in post-Independence Delhi, a similar transition toward relating city growth to concentrations of population, and socio-economic structure of the city (rather than physical features) did occur in the city. In the early part of the nineteenth century, maps showing accurate topography and landscape elements such as the 'Sketch of the Environs of Delhi' (figure 6) and 'Shahjahanabad' (figure 7) were made; such knowledge was important background for the location of new residences, institutions, and military posts. By the middle of the twentieth century however, graphic translations of material that had been collected through land surveys, socio-economic studies, and population census had formed a new layer of information on the maps.

A parallel development and the second major characteristic of this period was the emergence of the thematic map as the main analytic tool for understanding and planning the form of cities. In the words of Arthur Robinson, a thematic map:

"....concentrates on showing the geographical occurrence and variation of a single phenomenon. Instead of having as its primary function the display of the relative locations of a variety of different features, the pure thematic map focuses on the differences from place to place of one class of feature , that class being the ''theme' of the map. An important difference between general and thematic maps and a characteristic of the latter is the portrayal of the variations within a class of features so that the pattern or structure of the distribution becomes apparent."[67]

First developed in France in the second half of the eighteenth century to study the social and economic consequences urbanization and industrialization, such single-project maps were powerful tools that permitted separate examination of different aspects of the city in a way that general maps could not. In Delhi, the breaking up of the city into layers of information was symbolic of the perceived plurality of the city. It reflected

[66]Konvitz, *Cartography in France,* p 142.

[67]Konvitz, *Cartography in France,* p 103; quoted from Robinson, *Early Thematic Mapping,* pp 16-17.

the imminent perception of the city as composed of an interconnected network of services and functions. Such an effort, particularly targeted towards arriving at a master plan for the city resulted from the new scientific and functional approach to urban planning that was brought to India by the Ford Foundation sponsored team of international planners in the 1950's, when most of the maps of this type were produced.

From a topological and pictorial record of the physical environment in the 1750's to an abstract representation of the urban system in the 1950's, maps have not only documented the physical and socio-economic urban condition, but have also responded through change in technique and content to the changing values about the city and its growth.

Afterword

In the preceding three chapters, the development of cartographic representation of Delhi -- since the inception of Shahjahanabad in 1647 -- was looked at in parallel with the development of the city. In both, the evolution of similar notions of space, space relationships and socio-political values was observed; in the former this was reflected in the technique, style and content of representation, and in the latter it underlay the development of a particular pattern of growth. The parallel analysis of city and map over a period of time was an attempt to correlate the observed cartographic fact with the context within which it was produced. It was a search for factors in the city beyond morphological change, that conditioned the emergence of map content and fashioned the style of representation.

The nature of the interaction between map and context that emerges from this study corroborates the thesis that transformations in the form and content of maps can be attributed to changing values in the city as much as to its changing topography. Without intending to be an explicit symbol or metaphor, a map -- even in its 'scientific', documentary role -- can represent the social and political inclinations of society. As Harley says, in his general discussion on the political symbolism of maps:

"Estate maps though derived from instrumental survey, symbolized a social structure based on landed property; county and regional maps, though founded on triangulation, articulated local values and rights; maps of nation states, though constructed along arcs of the meridian, were still a symbolic shorthand for a complex of nationalist ideas; world maps, though increasingly drawn on mathematically defined projections, nevertheless gave a spiraling twist to the manifest destiny of European conquest and colonization. Even celestial maps, though observed with ever more powerful telescopes, contained images of constellations which sensed the religious wars and the political dynasties of the terrestrial world"[68]

[68]Harley, "Maps, Knowledge, and Power", p 300.

Similarly, each map that has been discussed offers more information than it depicts; a deeper reading reveals a story about the city at the time that it was conceived. For example, early eighteenth century maps of Shahjahanabad acknowledged the perceptual and real importance of the imperial core -- comprising of the two main streets, the palace-fortress and the mosques -- by showing it consistently in exaggerated proportion. An awareness of the geometrical relationship between its elements (seen in all maps) emphasized the contiguity-based spatial understanding that characterized the design. And, the omission of the surrounding residential structure instantly pointed to its lowly status in the imperial city.

The appearance of surveyed landscape and geographical features around the city -- seen first in 'Sketch of the Environs of Delhi' (figure 5) -- accompanied the emerging military needs of reconnaissance and familiarization with the terrain. The movement of maps, in this period, towards showing accurate information of land and property represented a society that was becoming increasingly reliant on such accumulated statistical information in making administrative and developmental decisions.

The appearance and disappearance of residential texture and detail in surveyed topographic maps of the late nineteenth and early twentieth centuries, obviously did not signify the presence and absence of residential units in different periods. Rather, it represented the fluctuating attention towards the form-generating capacity of the residential module or individual unit in the overall scheme of the city Along the same lines, the decreasing degree of detail in representations of the walled city since the initial topographic plan 'Shahjahanabad' (figure 6), and the sudden increase in map studies of it in the twentieth century was concurrent with the level of attention the city received in the political process at the time.

And finally, the advent of thematic maps of the city separating city functions into different layers represented the effort to rationalize what was by now an overwhelmingly complex city. The evolution of modern institutions such as the Housing Board, the Transportation Authority, and the Electricity Board

-- each incharge of a particular city function -- necessitated a 'thematic' understanding of the city and further fractured the ability to view the city comprehensively. The city became a problem and the maps a response to and representative of the search for a solution.

As these maps show, the technique and content of cartography in Delhi has kept pace with not only the topographic transformation of the city, but also with modified perceptions of it in different periods resulting from changing social and political values. Eventually, the thesis is an exploration of the idea that cartographic fact and its presentation can, in itself, be a representation of a perceived mental structure of the city, and encode prevailing theories of urban form, and that there exists a latent sociopolitical intention in the very act of representation.

The thesis -- that maps are conditioned by dominant socio-political ideas and encode prevailing theories of form -- provokes some pertinent questions regarding the influence of maps on future thought and action on the city. If, besides being morphological records, maps are also a formalization of values that have typically characterized city growth, how do they reinforce and perpetuate these values in succeeding periods? Does the information contained in them serve as a significant input in future development?

In early maps and cosmographies, this instrumentality is not so evident. Though an interaction between map making and city building is seen, there is not enough information to establish a continuing influence. With the introduction of scientific principles of map making and an increase in carefully surveyed information, maps become graphic inventories of social and physical data. While such information in itself does not constitute a plan, it becomes an input for decisions on growth. Such maps precede development that might be influenced by the kind of information they contain. In due course maps, -- such as the initial New Delhi Plan -- actually begin to forecast the new form of the city. For the first time, a map becomes projective in nature, preceding a form of growth that it itself suggests. Its role in the development process is finally established with the advent of thematic maps. These are representations of the need to

rationalize and analyze the city as well as a tools to do so. In this stage the use of maps precedes not only the form of the city but also the process of arriving at one.

It appears that as maps become inventories for future reference, and as they acquire the ability to invite decision on the basis of the analysis they offer, they become significant participants in the development process. They become potential 'plans' -- defined as instruments of growth. In looking at the development trajectory of maps in the city of Delhi, we see an increasing overlap of map as representation with map as plan.

While this thesis has been more exploratory than methodical in its research, in the ideas that have been generated, it does forward a claim for the study of cartographic history -- not only with reference to the discipline of map making -- but from the perspective of its potential influence on historical developments in the city.

Source of Illustrations

Figures

Cover	Jaipur Column, Viceroy's Court, Edwin Lutyens. **Irving, R. G.,** *Indian Summer: Lutyens, Baker, and Imperial Delhi.* p. 245.
1	**Gole, Susan,** *Indian Maps and Plans from the earliest times to the advent of European surveys.* p. 178.
2	**Gole,** p. 174.
3	**Gole,** p. 98.
4	**Nilsson, Sten,** *The New Capitals of India, Pakistan, and Bangladesh.* p. 31.
5	**King, Anthony D.,** *Colonial Urban Development: Culture, social power, and environment.* p. 187.
6	**Gole,** p. 177.
7	**King,** p. 190.
8	**King,** p. 192.
9	**King,** p. 206.
10 and 11	**Oriental and India Office Collections**, The British Library: London.
12	**King,** p. 207.
13	**King,** p. 229.
14	**King,** p. 233.
15	**Irving,** p. 74.
16	**Irving,** p. 76.
17	**Delhi Development Authority,** *Master Plan for Delhi, 1962.*
18	**Breese, Gerald W.,** *Urban and Regional Planning for the Delhi-New Delhi Area: Capital for Conquerers and Country.* p. 33.
19	**Delhi Development Authority,** *Master Plan for Delhi, Perspective 2001, 1992.* p. 122.
20	**Delhi Development Authority,** *Master Plan for Delhi, Perspective 2001, 1992.* p. 123.

i	**Gole,** p. 176.
ii	**Gole,** pp. 168, 169.
iii	**Gole,** p. 170.
iv	**Markham, C.,** *A Memoir of the Indian Survey.*
v	**King,** p. 199.
vi and vii	**King,** p. 101.
viii	**King,** p. 245.
ix	**Nilsson,** p. 48.

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